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Threader™

MONORAIL™

OVER-THE-WIRE

Micro-Dilatation Catheter

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Rx ONLY

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

WARNING

Contents supplied STERILE using an ethylene oxide (EO) process. Do not use if sterile barrier is damaged. If damage is found, call your Boston Scientific representative.

For single use only. Do not reuse, reprocess or resterilize. Reuse, reprocessing or resterilization may compromise the structural integrity of the device and/or lead to device failure which, in turn, may result in patient injury, illness or death. Reuse, reprocessing or resterilization may also create a risk of contamination of the device and/or cause patient infection or cross-infection, including, but not limited to, the transmission of infectious disease(s) from one patient to another. Contamination of the device may lead to injury, illness or death of the patient.

After use, dispose of product and packaging in accordance with hospital, administrative and/or local government policy. Carefully read all instructions prior to use. Observe all warnings and precautions noted throughout these instructions. Failure to do so may result in complications.

DEVICE DESCRIPTION

Boston Scientific Threader Over-The-Wire Micro-Dilatation Catheter and Threader Monorail Micro-Dilatation Catheter. The generic name of the device is Over-The-Wire Percutaneous Transluminal Coronary Angioplasty Dilatation Catheter/Rapid Exchange Percutaneous Transluminal Coronary Angioplasty (PTCA) Dilatation Catheter.

The Threader Over-The-Wire (OTW) and Threader Monorail (MR) Micro-Dilatation Catheters, from Boston Scientific, are Over-The-Wire and rapid exchange catheters, respectively, with a semi-compliant balloon near the distal tip. The Threader OTW and Threader MR catheters are offered in a 1.2 x 12 mm configuration. The distal section of both catheters (and the proximal section of the OTW catheter) is dual lumen and coaxial. The outer lumen is used for inflation of the balloon, and the inner lumen permits the use of guidewires ≤0.014 in (0.36 mm) to facilitate advancement of the catheter to the stenosis.

The proximal section of the rapid exchange catheter is a single-lumen, stainless steel hypotube with a single luer port hub for inflation/deflation of the balloon. The PowerCoil™ technology makes up the mid-shaft and distal section which consists of a polymer-sheathed stainless steel coil. The OTW catheter has a dual luer port hub: one for inflation/deflation of the balloon, the other for guidewire lumen access. The PowerCoil technology makes up the proximal shaft of the OTW catheter which consists of a polymer-sheathed stainless steel coil. The balloon is designed to provide an inflatable segment of known diameter and length at recommended pressures. A balloon protector is placed over the balloon to maintain a low profile and a mandrel is placed into the inner lumen to protect the patency of the catheter prior to use. The catheter's tip is tapered to facilitate advancement of the catheter to the stenosis. The shafts have ZGlide™ (hydrophilic) coating. For MR, the distal 22 cm of the device including the balloon and tip are coated with ZGlide. For OTW, the distal 60 cm of the device including the balloon and tip are coated with ZGlide. In addition, both MR and OTW devices have Xtra™ (hydrophobic) coating applied to the tip and balloon.

The effective length of both the OTW and MR devices is 150 cm. Marks on the proximal portion of the catheter shaft indicate the imminent exit of the balloon catheter tip out of the guide catheter (mark present at 90 cm and at 100 cm).

A radiopaque marker band, in conjunction with fluoroscopy, aids in the placement of the catheter's balloon segment. The Threader Micro-Dilatation Catheter has one radiopaque marker band located in the center of the balloon body. A CLIPIT™ Hypotube Clip is provided with the Threader Monorail Micro-Dilatation Catheter to aid in handling the catheter.

Contents

One (1) Threader (Monorail or Over-The-Wire) Micro-Dilatation Catheter

One (1) CLIPIT Hypotube Clip (Threader Monorail Micro-Dilatation Catheter Only)

INTENDED USE/INDICATIONS FOR USE

The Threader Micro-Dilatation Catheters are indicated for per-dilatation of the stenotic portion of a coronary artery or bypass graft stenosis (≥70% stenosis) for the purpose of improving myocardial perfusion.

The Threader Micro-Dilatation Catheters are intended to provide support to facilitate the placement of guidewires in the coronary vasculature. The Threader Over-The-Wire Micro-Dilatation Catheter can also be used to exchange one guidewire for another.

The Threader Over-The-Wire Micro-Dilatation Catheter is also intended to allow hand-injection of contrast media into the coronary vasculature.

CONTRAINDICATIONS

The Threader Micro-Dilatation Catheter is contraindicated for use in:

- Unprotected left main coronary artery disease.
- Coronary artery spasm in the absence of a significant stenosis.

WARNINGS

- PTCA in patients who are not acceptable candidates for coronary artery bypass graft surgery requires careful consideration, including possible hemodynamic support during PTCA as treatment of this patient population carries special risk.
- Use prior to the "use by" date as indicated on the label.
- Use extreme caution and careful judgment in patients for whom anticoagulation is contraindicated.
- Use extreme caution and careful judgment in patients who have reaction to contrast agents that cannot be adequately pre-medicated.
- PTCA should only be performed at hospitals where emergency coronary artery bypass graft surgery can be performed.
- To reduce the potential for vessel damage, the inflated diameter of the balloon should approximate, or be less than, the diameter of the vessel just proximal and distal to the stenosis.
- Use only the recommended balloon inflation medium. Never use air or any gaseous medium to inflate the balloon.
- When the balloon catheter is exposed to the vascular system, it should be manipulated while under high-quality fluoroscopic observation. Do not advance or retract the catheter unless the balloon is fully deflated. If resistance is felt during manipulation, determine the cause of the resistance before proceeding.
- Do not exceed the balloon rated burst pressure. The rated burst pressure is based on the results of in vitro testing. At least 99.9 percent of the balloons (with a 95 percent confidence) will not burst at or below their rated burst pressure.
- Use of a pressure monitoring device is recommended to prevent over or under pressurization.
- If difficulty is experienced during balloon inflation, do not continue; remove the catheter.
- Before withdrawing the balloon catheter, visually confirm complete balloon deflation by fluoroscopy.
- Balloon catheter retrieval methods (use of additional wires, snares and/or forceps) may result in trauma to the treated vessel and/or the vascular access site. Complications can include but are not limited to bleeding, hematoma, pseudoaneurysm or dissection.
- The safety and effectiveness of the Threader Micro-Dilatation Catheter have not been established for the treatment of chronic total occlusions. The risk of adverse events is likely to be higher when treating such lesions. Physicians should be aware of this increased risk and the limitations of the available scientific evidence.

PRECAUTIONS

- The compatibility of the device has not been evaluated for the delivery of materials (e.g. alcohol or nitroglycerine, stem cells, etc.) through the guidewire lumen, other than those required for normal use.

- The balloon catheter should be used only by physicians trained in the performance of percutaneous transluminal coronary angioplasty.
- The safety and effectiveness of this PTCA balloon catheter for the treatment of in-stent restenosis (ISR) has not been established.
- This balloon is not intended for the expansion or delivery of a stent.
- Prior to angioplasty, the balloon catheter should be examined to verify functionality and to ensure that its size and shape are suitable for the specific procedure for which it is to be used.
- Caution should be taken not to overtighten a hemostatic adapter around the catheter shaft as lumen constriction may occur, possibly affecting inflation/deflation of the balloon.
- Before insertion of the balloon catheter, administer appropriate anticoagulant and coronary vasodilator therapy.
- Care should be taken to control the position of the guide catheter tip during manipulation of the balloon catheter.
- When loading or exchanging the balloon catheter, it is recommended to thoroughly wipe the guidewire clean for better catheter movement on the guidewire.
- Do not expand the balloon if it is not properly positioned in the vessel.
- In the case of simultaneous use of two Threader™ balloon catheters in one guide catheter, care should be taken when introducing, rotating, and removing guidewires and balloon catheters to avoid entanglement.

ADVERSE EVENTS

Potential adverse events (in alphabetical order) that may be associated with the use of a Micro-Dilatation Catheter include, but are not limited to, the following:

- abrupt closure
- acute myocardial infarction
- angina or unstable angina
- arrhythmia, including ventricular fibrillation
- arteriovenous fistula
- cardiac tamponade/pericardial effusion
- cardiogenic shock
- cerebrovascular accident/stroke
- coronary aneurysm
- coronary artery bypass graft surgery
- coronary artery spasm
- coronary vessel dissection, perforation, rupture or injury, possibly requiring surgical repair or intervention
- death
- drug reactions, including allergic reaction to contrast medium
- embolism
- hemodynamic compromise
- hemorrhage or hematoma
- hypo/hypertension
- infection
- minor vessel spasm
- myocardial ischemia
- pseudoaneurysm (at vascular access site)
- pyrogenic reaction
- renal failure
- respiratory insufficiency
- restenosis of the dilated vessel
- side branch occlusion
- slow flow/no reflow
- target vessel re-intervention
- thrombosis
- total occlusion of the coronary artery or bypass graft
- transient ischemic attack
- vasovagal reaction
- volume overload

HOW SUPPLIED

- Non-pyrogenic
- Do not use if package is opened or damaged.
- Do not use if labeling is incomplete or illegible.

Handling and Storage

Store in a cool, dry, dark place.

OPERATIONAL INSTRUCTIONS

One or more of each of the following materials are required for PTCA but not supplied with the Threader Over-The-Wire or Threader Monorail™ Micro-Dilatation Catheter.

Description

- Guidewire(s) of appropriate size for advancement of guide catheter
- Arterial sheath and dilator set (for femoral approach only)
- Guide catheter(s) in the appropriate size and configuration to select the coronary artery; minimum I.D. of guide catheter = 0.066 in (1.68 mm) (Threader Over-The-Wire Micro-Dilatation Catheter)
- Guide catheter(s) in the appropriate size and configuration to select the coronary artery; minimum I.D. of guide catheter = 0.056 in (1.42 mm) (Threader Monorail Micro-Dilatation Catheter)
- Contrast medium
- Sterile saline or heparinized normal sterile saline
- Inflation device with manometer
- ≤ 0.014 in (0.36 mm) x 300 cm guidewire(s) (Threader Over-The-Wire Micro-Dilatation Catheter)
- ≤ 0.014 in (0.36 mm) x 185 cm guidewire(s) (Threader Monorail Micro-Dilatation Catheter)
- 10, 12 or 20 ml (cc) luer-lock syringe
- Hemostatic adapter
- Three-way stopcock
- Guidewire torquing device

Inspection Prior to Use

Prior to angioplasty, carefully examine all equipment to be used during the procedure, including the catheter, to verify proper function. Verify that the catheter and sterile packaging have not been damaged. Verify that the catheter size is suitable for the specific procedure for which it is intended. Do not use if sterile package is damaged.

Note: Do not continue to use the catheter if damage occurs or sterility is compromised during use.

Inflation Device Preparation

1. Prepare the inflation device according to the manufacturer's instructions.
2. Purge the system of air using only the contrast medium.

Catheter Selection

The inflation diameter of the balloon catheter must not exceed the diameter of the coronary artery proximal and distal to the stenosis.

Catheter Preparation

1. Remove the catheter from the protective hoop. Use care when removing the catheter to avoid damage (e.g., shaft kink).
2. Remove the balloon protector and mandrel by grasping the catheter just proximal to the balloon (at the proximal balloon catheter bond site). With the other hand, gently grasp the balloon protector and remove distally. For Threader Over-The-Wire Micro-Dilatation Catheters, the mandrel will slide off with the balloon catheter protector. For Threader Monorail Micro-Dilatation Catheters, remove the mandrel distally after removing the balloon protector.

Caution: If unusual resistance is felt during removal of the balloon protector or mandrel, do not use the catheter and replace with another.

3. The Threader Monorail Micro-Dilatation Catheter may be coiled once and secured using the CLIPIT™ Clip provided in the catheter package. Only the proximal shaft should be inserted into the CLIPIT Clip; the clip is not intended for the distal end of the catheter. Remove the CLIPIT Clip prior to inserting the catheter into the patient's body.

Note: Care should be taken not to kink the shaft of the catheter upon application or removal of the CLIPIT Clip.

4. Prepare the catheter for purging. Fill a luer lock syringe or inflation device with appropriate balloon catheter inflation medium (e.g., the equivalent of a 50:50 mixture of contrast medium and sterile saline). **Do not use air or any gaseous medium to inflate the balloon catheter.**

5. Connect a three-way stopcock to the port fitting on the catheter. Flush through the stopcock taking care to ensure that the balloon cannot be inflated. Connect syringe or inflation device to stopcock. Assure luer connections are properly aligned to avoid stripping the luer thread causing subsequent leakage and use care when connecting the catheter to avoid damage (e.g., shaft kink).
6. Hold the syringe or inflation device with the nozzle pointing downward and aspirate for 5 seconds. Release the plunger or open stopcock to air.
7. Remove the syringe or inflation device and evacuate all air from the barrel.
8. Reconnect the syringe and aspirate until bubbles no longer appear during aspiration. If bubbles persist, check luer connections. If bubbles still persist, inflate the balloon to verify that there are no leaks present prior to insertion. Do not use the balloon catheter if there are any leaks.
9. To remove any air lodged in the distal luer fitting of the inflation device, purge approximately 1 ml (cc) of contrast medium while holding the inflation device pointing upwards.
10. Disconnect the syringe used in preparation. Verify that a meniscus of contrast medium is evident in both the balloon catheter port and the inflation device connection to ensure a fluid to fluid connection. Adding a drop of inflation medium to the port may be necessary. Securely couple the inflation device to the balloon catheter port of the catheter.
11. Open the stopcock to the catheter and leave on neutral.

Insertion Procedure

1. Guidewire Lumen Flush
 - A. For the Threader Monorail Micro-Dilatation Catheter, flush the guidewire lumen of the catheter with sterile saline through the distal tip of the catheter.
 - B. For the Threader Over-The-Wire Micro-Dilatation Catheter, flush the guidewire lumen of the catheter with sterile saline through the guidewire port of the catheter hub.
 - C. Check for bends, kinks and other damage. Do not use if any defects are noted.
2. Catheter Advancement
 - A. Prepare the vascular access site according to standard practice.
 - B. Maintain neutral pressure on the inflation device attached to the catheter.
 - C. Insert a guidewire through the hemostatic adapter following the manufacturer's instructions or standard practice. Advance the guidewire carefully into the guide catheter. When complete, withdraw the guidewire introducer, if used.
 - D. Attach a torque device to the guidewire, if desired. Under fluoroscopy, advance the guidewire to the desired vessel, then position the distal wire in the desired location.
 - E. Backload the distal tip of the catheter onto the guidewire ensuring that the guidewire exits the midsection opening in the Threader Monorail Micro-Dilatation Catheter or the wire port of the Threader Over-The-Wire Micro-Dilatation Catheter manifold. When loading or exchanging the catheter, it is recommended to thoroughly wipe the guidewire clean for better catheter movement on the guidewire.

Note: To avoid kinking, advance the catheter slowly, in small increments, until the proximal end of the guidewire emerges from the catheter.

- F. Thoroughly aspirate and flush the guide catheter in preparation for introduction of the balloon catheter.
- G. Carefully advance the catheter through the hemostatic adapter while the balloon is fully deflated. If unusual resistance is felt, do not advance the catheter through the adapter. Caution should be taken not to over tighten the hemostatic adapter around the catheter shaft as lumen constriction may occur, affecting inflation/deflation of the balloon.

Note: To avoid kinking, advance the catheter slowly, in small increments, until the proximal end of the guidewire emerges from the catheter.

- H. Advance the catheter over the guidewire under direct fluoroscopic visualization and position the balloon relative to the stenosis to be dilated. Use the center radiopaque marker band as a reference point. Balloon inflation should not be undertaken if the balloon is not properly positioned within the stenosis.
- I. In the event, when using the Threader™ Over-The-Wire Micro-Dilatation Catheter, that contrast media is needed, withdraw the guidewire and hand-inject contrast media through the catheter hub with a syringe.
- J. In the event, when using the Threader Over-The-Wire Micro-Dilatation Catheter, that an alternative guidewire is needed, remove the guidewire while holding the hub of the Over-The-Wire Micro-Dilatation Catheter in place. Once the guidewire has been removed from the patient, an alternative guidewire can be introduced into the hub of the Over-The-Wire Micro-Dilatation Catheter and advanced to the distal tip of the catheter.
- K. Simultaneous use of two balloon catheters in a guide catheter (Kissing Balloon): Bench testing has shown that one Threader Monorail™ Micro-Dilatation Catheter and one 3.25 x 20 mm (or smaller) Emerge Monorail PTCA Dilatation Catheter can be inserted simultaneously into a 6F (minimum 0.070 in ID) guide catheter and one Threader Over-The-Wire Micro-Dilatation Catheter and one 3.25 x 20 mm (or smaller) Emerge Over-The-Wire PTCA Dilatation Catheter can be inserted into an 8F (minimum 0.088 in ID) guide catheter with acceptable compatibility. These tests did not account for all clinical situations and differing anatomy. Care should be used when attempting to use two balloon catheters simultaneously in a guide catheter; this technique was not clinically evaluated for safety and effectiveness in a clinical study. Balloon catheters with a diameter greater than those mentioned have not been tested for simultaneous use in a single guide catheter.
3. Catheter Inflation
- A. Inflate the balloon slowly to the appropriate pressure to perform PTCA. Maintain negative pressure on the balloon between inflations. Do not exceed the rated balloon burst pressure. Refer to the balloon compliance table or chart. If difficulty is experienced during balloon inflation, do not continue inflation; deflate and remove the catheter.
- B. After completion of PTCA, deflate the balloon by pulling negative pressure on the inflation device until the balloon is fully deflated. Bench testing has demonstrated that the deflation times range from 2 to 5 seconds.
- C. Confirm angiographic results using standard angiographic techniques. Fluoroscopic visualization during balloon expansion should be used to properly judge the optimum expanded balloon diameter as compared to the proximal and distal coronary artery diameter(s). Repeat inflation of balloon until the desired result is achieved.
- D. If catheter exchange is necessary, proceed to step 5 – Catheter Exchange Procedure (Threader Over-The-Wire Micro-Dilatation Catheter) or step 6 – Catheter Exchange Procedure (Threader Monorail Micro-Dilatation Catheter). Otherwise, proceed to step 4 – Catheter Removal.
4. Catheter Removal
- A. Confirm with angiography that the lumen of the dilated artery has not abruptly occluded. Ensure balloon is fully deflated.
- B. While withdrawing the deflated catheter and guidewire from the guide catheter through the hemostatic adapter, tighten the hemostatic adapter.
- C. The Threader Monorail Micro-Dilatation Catheter may be coiled once and secured using the CLIPIT™ Clip provided in the catheter package. Only the hypotube should be inserted into the CLIPIT Clip; CLIPIT is not intended for the distal end of the catheter. Remove the CLIPIT Clip prior to the catheter being inserted in the patient's body.

Note: Care should be taken not to kink or bend the shaft upon application or removal of the coil clip.

5. Catheter Exchange Procedure (Threader Over-The-Wire Micro-Dilatation Catheter)
- The Threader Over-The-Wire Micro-Dilatation Catheter typically requires two operators to exchange. To perform a catheter exchange, execute the following steps:
- Loosen the hemostatic adapter.
 - The primary operator holds the hemostatic adapter in one hand, while grasping the catheter shaft in the opposite hand.
 - While maintaining guidewire position, withdraw the deflated catheter until the catheter tip exits the hemostatic adapter.
 - Close the hemostatic adapter and remove the catheter from the guidewire while maintaining guidewire position across the stenosis.
 - Prepare the next device and load onto the guidewire as described in step 2.
 - Continue the procedure.
6. Catheter Exchange Procedure (Threader Monorail Micro-Dilatation Catheter)
- The Threader Monorail Micro-Dilatation Catheter has been specifically designed for rapid, single operator catheter exchanges. To perform a catheter exchange, execute the following steps:
- Loosen the hemostatic adapter.
 - Hold the guidewire and hemostatic adapter in one hand, while grasping the catheter shaft in the opposite hand.
 - Maintain the guidewire position in the coronary artery by holding the guidewire stationary. Begin pulling the deflated catheter out of the guide catheter while maintaining the guidewire position under fluoroscopy.
 - Withdraw the catheter until the opening in the guidewire lumen is reached (approximately 25 cm proximal to the balloon catheter tip).
 - While maintaining guidewire position, carefully slide the flexible, distal portion of the catheter out of the hemostatic adapter, and tighten the hemostatic adapter onto the guidewire to hold it securely in place. Completely remove the catheter from the guidewire while maintaining guidewire position.
 - Prepare the next device and load onto the guidewire as described in step 2.
 - Continue the procedure.

Typical Threader Micro-Dilatation Catheter Balloon Compliance

Pressure		Balloon size is listed as mm (nominal = 6.0 atm) *Rated Burst Pressure. DO NOT EXCEED.
atm	kPa	1.2 mm
3.0	304	1.06
4.0	405	1.11
5.0	507	1.15
6.0 (nominal)	608	1.18
7.0	709	1.21
8.0	811	1.23
9.0	912	1.24
10.0	1013	1.26
11.0	1115	1.27
12.0	1216	1.28
13.0	1317	1.29
14.0*	1419	1.30

Note: Over inflation may result in burst of the balloon or shaft.

WARRANTY

Boston Scientific Corporation (BSC) warrants that reasonable care has been used in the design and manufacture of this instrument. **This warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose.** Handling, storage, cleaning and sterilization of this instrument as well as other factors relating to the patient, diagnosis, treatment, surgical procedures and other matters beyond BSC's control directly affect the instrument and the results obtained from its use. BSC's obligation under this warranty is limited to the repair or replacement of this instrument and BSC shall not be liable for any incidental or consequential loss, damage or expense directly or indirectly arising from the use of this instrument. BSC neither assumes, nor authorizes any other person to assume for it, any other or additional liability or responsibility in connection with this instrument. **BSC assumes no liability with respect to instruments reused, reprocessed or resterilized and makes no warranties, express or implied, including but not limited to merchantability or fitness for a particular purpose, with respect to such instruments.**

EC REP **EU Authorized Representative**

Boston Scientific International S.A.
55 avenue des Champs Pierreux
TSA 51101
92729 NANTERRE CEDEX
FRANCE

AUS **Australian Sponsor Address**

Boston Scientific (Australia) Pty Ltd
PO Box 332
BOTANY
NSW 1455
Australia
Free Phone 1800 676 133
Free Fax 1800 836 666

 **Legal Manufacturer**

Boston Scientific Corporation
One Boston Scientific Place
Natick, MA 01760-1537
USA
USA Customer Service 888-272-1001

 **Do not use if package is damaged.**

 **Recyclable Package**

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