CHARLOTTE™

7.0 Multi-Use Compression Screw System

SURGICAL TECHNIQUE

WRIGHT.

Contents

Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training and experience. Prior to use of the system, the surgeon should refer to the product package insert for complete warnings, precautions, indications, contraindications and adverse effects. Package inserts are also available by contacting Wright Medical Technology, Inc.

Preoperative Planning

chapter 1

Introduction

The CHARLOTTE™ 7.0 Multi-Use (MUC) Compression Screw System is a versatile tool for fusions and/or osteotomies of the hindfoot and ankle. It has been designed primarily for fixation of subtalar fusions, ankle fusions, and calcaneal osteotomies. The CHARLOTTE™ MUC Screw is a self-drilling, self-tapping dual pitch compression screw. It is particularly useful in demanding environments where a high amount of compression and stability is required. In addition, its headless design eliminates profile-related issues associated with traditional lag screw designs.

Surgical Goals

- To provide maximum compression at the fusion site of two adjacent bones.
- To obtain maximum thread engagement in the distal fragment, to maximize the "lag effect" necessary for good compression.
- To ensure that the head of the screw is completely countersunk, so profile-related issues may be avoided.

System Basics

- All implant components are manufactured from surgical-grade stainless steel for maximum strength and stiffness.
- The distal threaded portion of the screw is 7.0mm in diameter; the head is 10mm in diameter.
- Screws come in lengths from 40mm-110mm in 5mm increments.
- All screws are cannulated to work over a 2.5mm single-tip Guide Wire, which is included in the set.
- All screws are designed to be self-drilling and self-tapping. However, a drill, tap and countersink are included for optional use. This system also includes a power driller.
- Screws from 40-45mm are available with a 16mm distal thread length. Screws from 50-70mm are available with a 20mm distal thread length. Screws from 75-110mm have the option of 20mm or 32mm distal thread length.

Surgical Technique

chapter 2

Subtalar Arthrodesis

Exposure/Preparation

Expose the subtalar (talocalcaneal) joint and sinus tarsi through a lateral Ollier approach. Distract the joint with a lamina spreader, and sharply debride the articular cartilage to expose bleeding subchondral bone. A powered drill can also be used to further penetrate the subchondral bone to ensure that bleeding bony surfaces are in apposition prior to screw insertion.

Guide Wire Placement/Determination of Screw Length

Using a powered drill and small Jacobs chuck, drive the 2.5mm x 230mm Threaded Guide Wire (P/N 25656000) percutaneously into the calcaneus and, with the aid of fluoroscopy, direct it at the dorsal medial extent of the talus. **| Figure 1**

Continue advancing the Guide Wire under fluoroscopic guidance until the tip touches, but does not penetrate, the anterior cortical bone of the talus. Create a 1-2cm incision around the Guide Wire. Take a Length measurement either directly from the Guide Wire, or using the Cannulated Depth Gauge (P/N 25657000). **| Figure 2**

If the Guide Wire is positioned obliquely to the surface of the calcanous, choose a shorter screw length to account for measuring error related to head countersinking. **| Figure 3** Choose the long or short threaded screw based on how much of the Guide Wire is within the talus - for most patients, the short thread will be appropriate. For effective compression, it is essential that the screw threads completely cross the joint line.

For a more detailed and accurate method for screw measurement, refer to **Appendix A**.

Figure 1 |

Figure 2 |

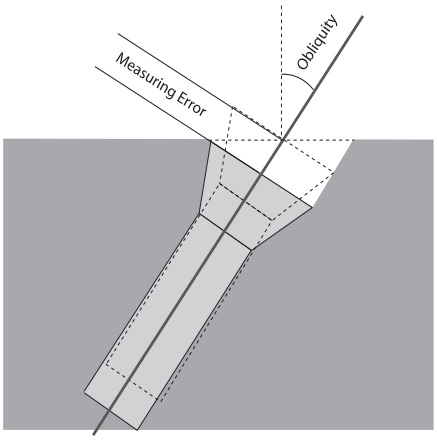

Figure 3 |

Screw Insertion

In many cases, the 7.0 MUC Screw may be installed without the use of a drill or tap. However, a drill (P/N 44172010) tap (P/N 44172020) and a counter sink (P/N 44172015) are included in the system for use with particularly hard bone. Each of these instruments is cannulated.

Slide the cannulated screw and driver (P/N 44172030) over the K-Wire and engage the screw head. **| Figure 4** Advance the screw until the head is completely countersunk into the bone. **| Figure 5 and Figure 6** Screw position should be verified fluoroscopically at this time.

A second screw may be required based upon stability of the first screw or patient-related factors (obesity, activity level and compliance issues, etc.).

The Guide Wire may now be removed from the site. The operative site is closed with sutures or skin staples, and covered with a standard post-operative dressing.

Figure 4 |

Figure 5 |

Figure 6 |

Accurate Measument of Screw Lengths

The surgeon can make two screw sizing decisions (overall screw length, distal thread length) based upon three clinical measurements taken during Guide Wire insertion.

- Distance to fusion line
- Distance to far cortex
- Obliquity of Guide Wire with respect to bony surface

1) Using a powered drill and small Jacobs chuck, drive the 2.5mm x 230mm Threaded Guide Wire (P/N 25656000) into the bone. Advance the Guide Wire until its tip is at the joint line between the two bones to be fused. Measure **distance to fusion line** directly from the Guide Wire or from the Cannulated Depth Gauge.

2) Continue advancing the Guide Wire under fluoroscopic guidance until the tip touches, but does not penetrate, the 2nd cortex of the distal bone. Measure **distance to far cortex** in the same manner as in Step 1.

3) Calculate distal thread length by subtracting the two distances. Since the screws only come in two varieties (long and short thread), any distal thread length less than 32mm requires a short thread screw.

4) Estimate the obliquity of the Guide Wire with respect to the bony surface of the calcaneus (a wire that is perfectly perpendicular to the surface has no obliquity).

5) The obliquity of the Guide Wire causes a measuring error that must be corrected to determine overall screw length. **| Figure A**

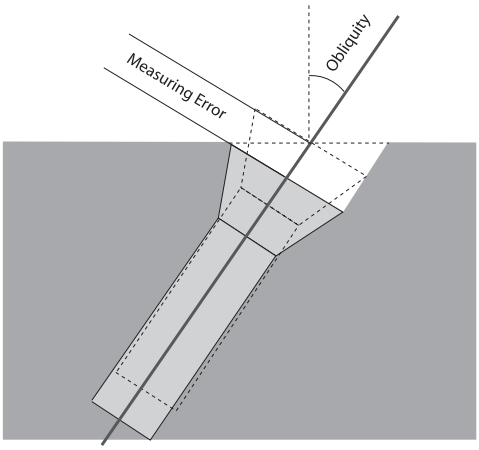

Figure A |

If the Guide Wire is perfectly perpendicular to the surface of the calcaneus, the **distance to far cortex** measurement may be used to determine overall length. However, if the Guide Wire is placed oblique to the exposed bony surface, the measurement will be artificially long. Estimate the **measuring error** from this table.

10° obliquity = 1mm measuring error
20° obliquity = 2mm measuring error
30° obliquity = 3mm measuring error
40° obliquity = 4mm measuring error
45° obliquity = 5mm measuring error

6) To determine the desired overall screw length, subtract the measuring error from the distance to far cortex. Round the number down to the nearest 5mm increment. (See example on next page)

EXAMPLE

When the tip of the Guide Wire is at the joint line, it reads 50mm. When it touches the opposing cortex of the talus, it reads 80mm. The Guide Wire is about 30° away from being perpendicular to the surface of the calcaneus. What is the correct screw?

By subtracting the 50mm measurement from the 80mm measurement, we can see that the distal thread length is 30mm and requires a short thread screw (being less than 32mm). Due to the 30° obliquity of the Guide Wire, we expect a 3mm measuring error (from previous chart). Therefore, any screw longer than 77mm will be too long (80mm - 3mm), and a 75mm overall screw length is chosen.

Ordering Information

CHARLOTTE™ 7.0 Multi-Use Compression Screws

Part Number	Description
44174016	7.0mm x 40mm x 16mm
44174516	7.0mm x 45mm x 16mm
44175020	7.0mm x 50mm x 20mm
44175520	7.0mm x 55mm x 20mm
44176020	7.0mm x 60mm x 20mm
44176520	7.0mm x 65mm x 20mm
44177020	7.0mm x 70mm x 20mm
44177520	7.0mm x 75mm x 20mm
44178020	7.0mm x 80mm x 20mm
44178520	7.0mm x 85mm x 20mm
44179020	7.0mm x 90mm x 20mm
44179520	7.0mm x 95mm x 20mm
44170020	7.0mm x 100mm x 20mm
44170520	7.0mm x 105mm x 20mm
44171020	7.0mm x 110mm x 20mm
44177532	7.0mm x 75mm x 32mm
44178032	7.0mm x 80mm x 32mm
44178532	7.0mm x 85mm x 32mm
44179032	7.0mm x 90mm x 32mm
44179532	7.0mm x 95mm x 32mm
44170032	7.0mm x 100mm x 32mm
44170532	7.0mm x 105mm x 32mm
44171032	7.0mm x 110mm x 32mm

CHARLOTTE™ 7.0 Multi-Use Compression Screw Instrumentation

Part Number	Description
25656000	Threaded K-Wire 2.5mm x 230mm
25657000	Screw Depth Gauge
44172010	Cannulated 5.0 mm Drill
44172015	Cannulated Counter Sink
44172020	Cannulated 7.0 mm Bone Tap
44172025	Quick Connect Handle (new)
44172030	Cannulated Hex Driver Tip
44172100 S	Sterilization Tray

Wright Medical Technology, Inc.
5677 Airline Road
Arlington, TN 38002
901.867.9971 phone
800.238.7188 toll free
www.wmt.com

Wright Medical Europe SA
Rue Pasteur BP 222
83089 Toulon Cedex 9
France
011.33.49.408.7788

SO054-206