

DARCO[®]

CPS[™] Plate

SURGICAL TECHNIQUE



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Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only as techniques used by Christopher F. Hyer, DPM; Greg Berlet, MD; Thomas Lee, MD and Ernst Orthner, MD. 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.

Introduction

Surgical Technique as described by Christopher F. Hyer, DPM;
Greg Berlet, MD; Thomas Lee, MD and Ernst Orthner, MD

The DARCO® CPS™ (Calcaneal Plating System) is a comprehensive, surgeon-friendly solution for calcaneal fractures. The CPS™ plate is found in the DARCO® MRS (Modular Rearfoot) System; this system is based around 3.5mm locking and non-locking screws, and contains a variety of plates for different surgical indications.

CPS™ Features

- » The entire plate has a smooth, low-profile of only 1.5mm; there are no prominent screw holes.
- » All screw holes may accept either locking or non-locking 3.5mm screws, for optimal bony fixation.
- » The plate may be easily contoured *in-situ* using the locking drill guides; no other benders are required.



Preoperative Planning

Prior to surgical intervention, thorough evaluation using radiograph and CT imaging of the fracture pattern is needed to accurately plan this complicated reduction. A healthy respect for the integrity and condition of the soft tissues is also needed and typically will delay surgery for 10 to 14 days or more.

The following items should be planned for in the operating room:

- » DARCO® MRS Plating System
- » CHARLOTTE™ 3.0 and 4.3mm Multi-Use Compression Screw set
- » PRO-DENSE® Injectable Regenerative Graft
- » Complete set of K-wires and large diameter Steinman or Shands pins
- » Powered handpiece with large-diameter wire driver and Jacobs chuck
- » Straight and curved osteotomes
- » Cobb periosteal elevator
- » Intraoperative fluoroscopy
- » Lamina spreader and/or wire-based distractor

Patient Positioning

Position the patient in a lateral decubitus position with padding of the appropriate bony prominences. It is recommended the down foot is scissored forward, and the operative foot positioned behind it and on top of several bulky blankets or sheets. This will allow better visualization with intraoperative C-arm without overlap from the other foot. Hemostasis may be accomplished with a thigh tourniquet.

Surgical Approach and Retraction

Draw an extensile lateral approach, local landmarks and the course of the sural nerve on the skin. Create a curved skin incision with vertical limb halfway between the peroneal tendons and Achilles, and the horizontal limb parallel to the plantar surface of the foot. The sural nerve is protected in both the proximal and distal aspect of the incision. Bring the incision sharply to bone after identification of the sural nerve. Raise the skin as a full-thickness flap in a subperiosteal plane; take care to protect and elevate the peroneal tendons within the flap. Direct visualization of the subtalar joint and the calcaneal-cuboid (CC) joint should now be possible. Care should be taken to delicately handle the flap with a “no touch” technique. 0.062 K-wires may be placed to maintain retraction of the flap while avoiding excessive tension. | **FIGURE 1**



FIGURE 1

Any synovitis or hematoma is carefully removed from within the subtalar joint; this will allow visualization of the intraarticular fractures of the posterior subtalar facet. | **FIGURE 2** Often, there is a 'blow-out' type fracture of the lateral wall of the calcaneus. This portion of the lateral wall may be carefully removed and held on the back table for later reimplantation.

Decompress the depressed joint fragments to allow reduction of the posterior facet of the subtalar joint. Often a Cobb elevator is used to elevate these fragments back up to match to opposing talar surface. Once the posterior facet is reduced, use 0.062 K-wires to provisionally fix the joint surface. Realignment of the joint is confirmed with both lateral and calcaneal axial fluoroscopy views.

Drive a large Steinman pin axially from the posterior calcaneal tuberosity. | **FIGURE 3** This pin may be used a joystick to aid in decompression and manipulation of the tuberosity.

Upon confirmation of posterior facet realignment, drive two 1.6mm guidewires for the CHARLOTTE™ 4.3mm Multi-Use Compression Screw from posterior lateral to anterior medial in a parallel fashion, just within the dense subchondral bone beneath the posterior facet. These wires target the stable sustentaculum fragment medially. Confirm correct length and placement of these wires with lateral and calcaneal axial views. Measure using the Cannulated Depth Gauge, drill with the 3.0mm Cannulated Drill Bit, and insert the appropriate length screws. The screws should be advanced in an alternating fashion, and care taken to prevent toggling of the articular fragments. Fluoroscopy is again performed to confirm correct screw placement within the sustentaculum and reduction of the subtalar joint.

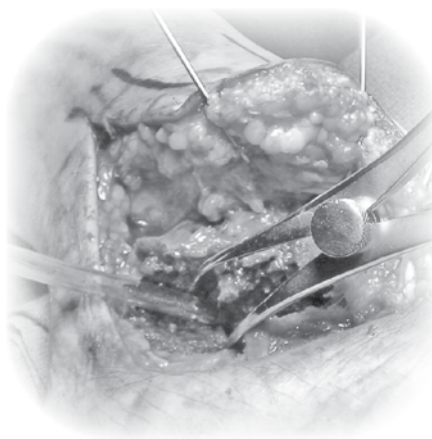


FIGURE 2



FIGURE 3

Attention is now directed to the position of the heel tuberosity. Typically this has been displaced superiorly, shortened, and/or rotated into varus. Lever the Steinman pin to manipulate the tuberosity back down and out of varus, then advance the pin to provide temporary stabilization. Lateral and calcaneal axial views are used to confirm that the plantar calcaneal cortex is realigned, and the heel is in a neutral position.

If preoperative CT scan indicated fracture extension into the anterior calcaneal body and/or calcaneal-cuboid (CC) joint, this is now addressed. Inspect the CC joint, reduce as necessary, and provisionally fix with 0.062 K-wires. It is important to ensure that the anterior body is reduced and not translated superiorly.

Replace the lateral wall fragment. Select the appropriately sized DARCO® CPS™ plate depending on patient anatomy, using fluoroscopy as a reference. The plate may be temporarily held in place with the 1.1mm K-wires from the set. The plate typically does not need to be pre-bent or contoured.

There is typically a bone void in the cancellous bone from the impaction of the injury. This void may be backfilled with PRO-DENSE® Injectable Regenerative Graft to provide a scaffold for new bone growth.

The DARCO® MRS system permits the usage of both locking and non-locking screws in all plate holes. Bicortical fixation is generally not required with locking screws; however, it should always be used with non-locking screws. Non-locking screws may be used to lag the plate closer to the underlying bone. If necessary, the PRO-DENSE® graft may be drilled to accept screws.

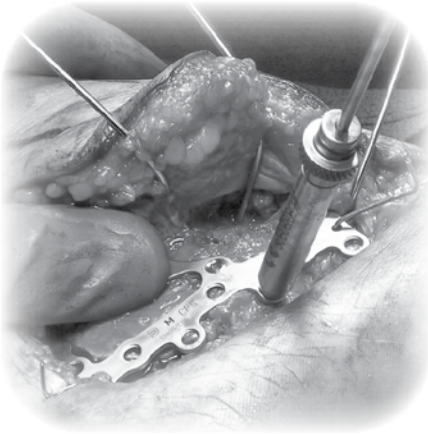


FIGURE 4

Thread the Locking Drill Guide (P/N DC4169) into a central screw hole that is sitting flush to bone. Use the 2.5mm Drill (P/N DC5136) through the locking drill guide. | **FIGURE 4** Remove the drill guide and use the Depth Gauge (P/N DC4263-2) to determine the appropriate screw length. | **FIGURE 5**

Insert the screw into the pre-drilled hole and drive until flush with the plate. Repeat the steps described above to prepare more screw locations. As you secure the plate centrally and move distal toward the CC joint, use a bone hook while anchoring the plate to prevent superior displacement of the anterior calcaneal body.

In-situ contouring of the plate is easily accomplished by threading the Locking Drill Guide into a screw hole and using it as a bender. In this manner, the plate may be anatomically contoured while protecting the locking threads in the plate.

C-arm is again used to confirm restoration of anatomic alignment and position of the hardware. | **FIGURE 6** Remove the provisional K-wires after final fixation of the fracture.

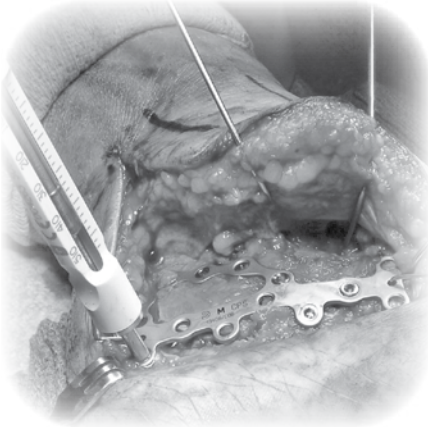


FIGURE 5

Wound Closure

Deep periosteal tissue may be closed with 0 absorbable suture. The subcutaneous tissue is closed with 2-0 absorbable suture, again using a “no-touch” technique. Sutures are initially placed at the periphery and gradually worked towards the apex of the flap. Skin is closed in an everted fashion.

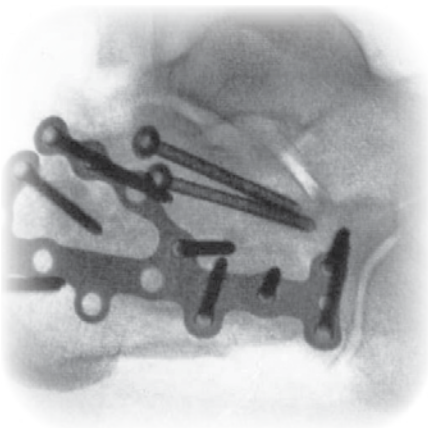


FIGURE 6

Ordering Information



Kit List

PART NO.	DESCRIPTION	QUANTITY
DMRSKITA	Implant Kit	
DMRSKIT1	Instrument Kit	

Locked Screws

DC 2820-014	14mm x 3.5mm	5
DC 2820-016	16mm x 3.5mm	5
DC 2820-018	18mm x 3.5mm	5
DC 2820-020	20mm x 3.5mm	5
DC 2820-022	22mm x 3.5mm	5
DC 2820-024	24mm x 3.5mm	5
DC 2820-026	26mm x 3.5mm	5
DC 2820-028	28mm x 3.5mm	5
DC 2820-030	30mm x 3.5mm	5
DC 2820-035	35mm x 3.5mm	5
DC 2820-040	40mm x 3.5mm	5

Non-Locked Screws

DC 2820-114	14mm x 3.5mm	2
DC 2820-116	16mm x 3.5mm	2
DC 2820-118	18mm x 3.5mm	2
DC 2820-120	20mm x 3.5mm	2
DC 2820-122	22mm x 3.5mm	2
DC 2820-124	24mm x 3.5mm	2
DC 2820-126	26mm x 3.5mm	2
DC 2820-128	28mm x 3.5mm	2
DC 2820-130	30mm x 3.5mm	2
DC 2820-135	35mm x 3.5mm	2
DC 2820-140	40mm x 3.5mm	2

Instruments and accessories

DC 35 Box	System tray assembly	1
DC 70-481	Bending forceps	1
DC 4157	Bending iron	1
DC 4169	Drill guide	2
DC 4263-2	Depth gauge	1
DC 4197	Forceps	1
DC 4261	Screwdriver, hexagonal, cannulated	1
DC 5136	Drill bit, 2.5mm	2
DC 5620	Cannulated drill bit 2.5mm	1
NO 2228-012	K-wire 140 x 1.1mm	6
DC 4584	Screw holding and bending iron	1

PART NO.	DESCRIPTION	PLACEMENT IN TRAYS									
LPS™ Plating System for TMT and Lapidus Fusions											
DC 2801-000	0mm step	<table border="1"> <tr><td>0</td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td colspan="2"></td></tr> </table>	0	1	2	3	4	5	6		
0	1		2								
3	4		5								
6											
DC 2801-001	1mm step										
DC 2801-002	2mm step										
DC 2801-003	3mm step										
DC 2801-004	4mm step										
DC 2801-005	5mm step										
DC 2801-006	6mm step										
PIA™ Evans Lateral/Column Lengthening Plate											
DC 2802-000	0mm spacer	<table border="1"> <tr><td>0</td><td>2</td><td>4</td></tr> <tr><td>6</td><td colspan="2">8</td></tr> </table>	0	2	4	6	8				
0	2		4								
6	8										
DC 2802-002	2mm spacer										
DC 2802-004	4mm spacer										
DC 2802-006	6mm spacer										
DC 2802-008	8mm spacer										
UPS™ 3.5 General Purpose Plate											
DC 2801-012	12mm	<table border="1"> <tr><td>12</td><td>16</td><td>20</td></tr> <tr><td>24</td><td colspan="2">30</td></tr> </table>	12	16	20	24	30				
12	16		20								
24	30										
DC 2801-016	16mm										
DC 2801-020	20mm										
DC 2801-024	24mm										
DC 2801-030	30mm										
RPS™ Rearfoot Medial/Lateral Column Reconstruction Plate											
DC 2803-006	37mm, 6 holes	<table border="1"> <tr><td>66</td><td rowspan="2">37</td></tr> <tr><td>50</td></tr> </table>	66	37	50						
66	37										
50											
DC 2803-008	50mm, 8 holes										
DC 2803-014	66mm, 14 holes										
AFP™ Tarsal Fusion Plate											
DC 2804-004	12mm	<table border="1"> <tr><td colspan="3"></td></tr> <tr><td>12</td><td>14</td><td>16</td></tr> </table>				12	14	16			
12	14		16								
DC 2804-005	14mm										
DC 2804-006	16mm										
DPS™ Fixation Step Plate											
DC 2806-106	6mm step	<table border="1"> <tr><td>6</td><td>8</td><td>10</td></tr> <tr><td colspan="3"></td></tr> </table>	6	8	10						
6	8		10								
DC 2806-108	8mm step										
DC 2806-110	10mm step										
CPS™ Calcaneus Plate											
DC 2805-001	S: 54mm	<table border="1"> <tr><td>L</td><td rowspan="2">S</td></tr> <tr><td>M</td></tr> </table>	L	S	M						
L	S										
M											
DC 2805-002	M: 64mm										
DC 2805-003	L: 74mm										

Additional Products



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PRO-DENSE®
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