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Cupid

Surgical Technique



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Accessing the Pedicle

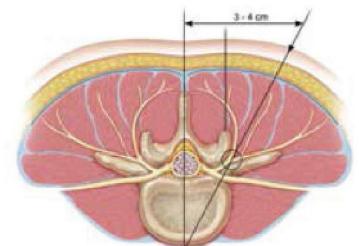
Patient Positioning

The patient should be positioned prone, lying flat on the table. Some tables have pedestals that make it difficult to get a true AP view of the pedicles. While adjustments in patient positioning can be made, tables that limit good AP and lateral fluoroscopy should be generally avoided.



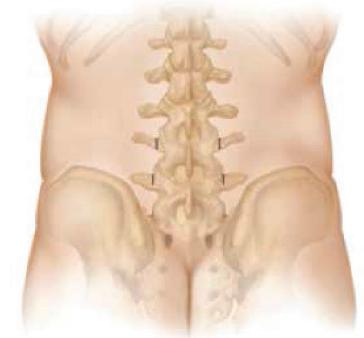
Preoperative Planning

- Verifying that adequate fluoroscopic images of the pedicles can be obtained in both AP and lateral views before proceeding.
- On AP and lateral fluoroscopy, the endplates should be parallel and the spinous processes should lie midway between both pedicles.



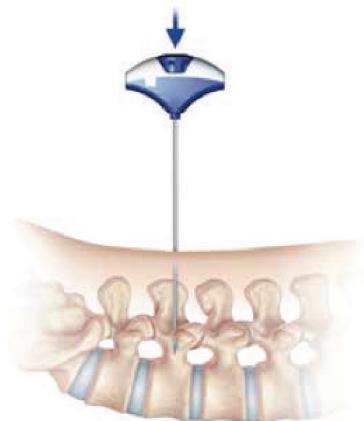
Skin Incision

- The Guide Pin may be used to verify the appropriate location of the skin incisions. The Guide Pin is first positioned on the skin perpendicular to the spinal column and directly through the projection center of the pedicles on an AP image. Mark the location of the pin with the surgical marker.
- Place the Guide Pin parallel to the spinal column to lay the projection of Guide Pin laterally to the lateral edge of targeted and adjacent pedicles on an AP image. Mark the location of the pin with the surgical marker.
- The incision should be at least 1cm lateral to intersection line and adjusted according to different patient anatomy.

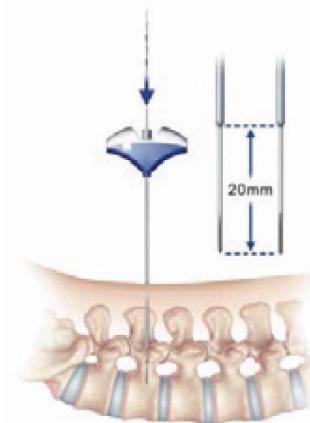


Pedicle Access

- Once the position is confirmed, a skin and fascial incision is then made approximately 15mm in length. A Starting Needle is used to gain access to the pedicle. After placing the Starting Needle at the intersection of the facet and the transverse process, and confirming direction on fluoroscopy, the needle is advanced into the pedicle.
- AP and lateral fluoroscopy should be used intermittently as needed to confirm direction. An AP image should show the needle tip initially at the lateral margin of the pedicle. As the needle advances towards the base of the pedicle on the lateral image, it should approach the pedicle center on the AP image. The Starting Needle should be advanced across the junction of the pedicle and the vertebral body to allow easier placement of the Guide Wire. AP and lateral fluoroscopy should be used to confirm the needle is within pedicle confines.

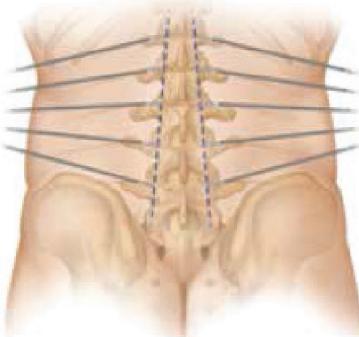


- Remove the inner stylet of the Starting Needle, ensuring the cannula is not removed from the pedicle.
- The Guide Pin is inserted through the cannula and into the pedicle. The Guide Pin should be advanced approximately 20mm into the vertebral body to allow for proper screw placement. AP and lateral fluoroscopy should be used to confirm the Guide Pin is within pedicle and vertebral body confines.



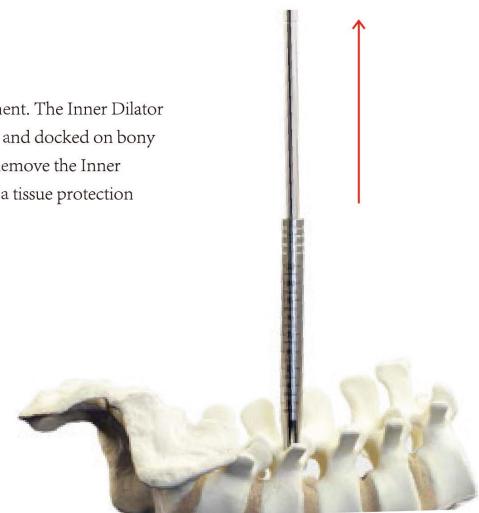
- Care should be taken when insert the Guide Pin. Depth marks of 5mm each on the Guide Pin helps contribute to confirm the insertion depth.
- When the Guide Pin has been advanced into the proper place, the cannula of the Starting Needle is carefully removed, leaving only the Guide Pin in place.

Note: for multi-level surgery, it is suggested to place the Guide Pins into all levels before inserting pedicle screws.

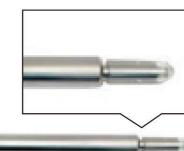


Pedicle Preparation

- The fascia and muscle must be dilated to allow for screw placement. The Inner Dilator and Outer Dilator are sequentially inserted along the Guide Pin and docked on bony anatomy to gently make a path of the appropriate dimension. Remove the Inner Dilator, leaving the Guide Pin and the Outer Dilator to serve as a tissue protection sleeve during tapping.



- Over the Guide Pin and through the Outer Dilator, insert the Awl Cannulated to make an opening on the cortical bone at the starting point.



- The pedicle is then prepared by driving the Tap Cannulated over the Guide Pin and through the Outer Dilator. When tapping, the depth marks on both Tap and Guide Pin should be noticed to avoid unintentional advancement or back-out of the Guide Pin.



- Ensure not to tap beyond the tip of the Guide Pin because the bone within the end of the Tap may cause the Guide Pin to pull out as you remove the Tap.
- Screw length can be estimated by referencing the depth marks on the Tap Cannulated.

- Remove the Tap exercising great care to not remove the Guide Pin.



Screw Insertion

- Connect the Screwdriver to the Handle with Quick Coupling. Select the appropriate screw and insert the tip of the Screwdriver into the screw head until the Screwdriver fully engages the screw. Thread the outer sleeve of the Screwdriver into the head of the screw until tight.



- One of the three Outer Sleeves can be selected according to patient skin thickness and placed over the Outer Dilator to protect the surrounding tissues when insert the screw.
- The screw is inserted over the Guide Pin and into pedicle after remove the Outer Dilator.



- After gaining initial purchase of the pedicle with the screw(about 20mm in depth), remove the Guide Pin to prevent it from being advanced too far. Then continue the screw insertion to the appropriate depth. It is suggested not to insert the screw too far, and to keep the bottom of the screw tulip head above the bony surface about 5mm. If the multiaxial head of the Cupid Screw is inserted flush with the bone, it will lose its multiaxial capability.



- Repeat the above steps to insert the remaining screws. Check the screw multiaxial capability and adjust the screw height to match the rod curve. Under fluoroscopy, visualize screws to ensure they line up coronally as much as possible.



- Once all the screws are in place, use the Break Off Iron to break off the two protected tails on the screw long arms.



Rod Placement

- Select the appropriate-length rod, and connect the rod to the Rod Holder. Use the Rod Holder Screwdriver to help lock the rod to the Rod Holder.



- If needed use the Rod Bender to bend the rod according to patient anatomy. As there is connecting clasp on the Rod Holder, it is suggested not to bend the rod prior to placing it in the Rod Holder.



- Perpendicular to the skin pass the rod through the cannulated long arms of the first screw until the rod tip reaches the bottom of the screw saddle.



- Advance the rod below the fiscia to the second screw and seat the rod along the first screw long arms and down to the screw saddle bottom.



- To ensure the Rod Holder blocking part is parallel to the long arms of the first screw which can help guarantee the rod has passed through the first screw long enough and the screw cap will not press down on the connecting clasp of the Rod Holder.



- Rotate the second screw by hand to test the rod passage. If the second screw rotates freely, then the rod has not passed through the second screw.

- For multilevel operation, it is suggested to use the Long Rod Holder.



Cap Insertion

- Attach a screw cap to the Nuts Holder, and rotate the caudal knob to help hold the screw cap more stable. Do not over-tighten the Nuts Holder which may cause damage to it.



- Insert all the screw cap into the screws and moderately tighten those caps to maintain the screw multiaxial capability which ensures the screw long arm can still be adjusted during the later steps.
- Attention should be paid to the two marker lines on the Nuts Holder. When the bottom mark line comes flush with screw long arms, it means the screw cap has come in touch with the screw thread; when the upper marker line sinks below screw long arms, it means the screw cap has been inserted to the bottommost thread. Rotate the caudal knob anticlockwise to remove the Nuts Holder.

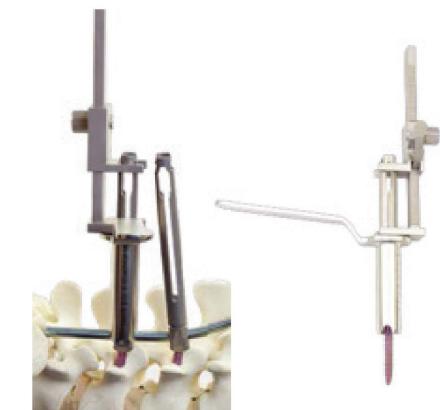


Reduction

- Generally, it can help seat the rod and achieve reduction when we insert the screw cap. The Reducer can be used as well to achieve reduction if required.



- Place the 60mm Outer Sleeve over the screw long arms and down to the rod. Draw close the Reducer and assemble it onto the screw: there are two U-shaped openings on Reducer. First hem the screw arm in the bottom U-shape opening which is then seated onto the Outer Sleeve. Slightly press the screw long arms to plug two teeth of the upper U-shape opening into the reduction slots on the screw arms.



- Rotate the hex knob on Reducer by using the Ratchet Wrench to reduce the screw.

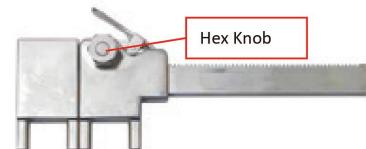


Distraction/Compression

- The Counter Torque can work as a lever when perform distraction or compression. Over the screw long arms slide the Counter Torque down to the rod.



- Adjust the two U-shaped openings on Distractor to the appropriate distance to fit the two adjacent Counter Torques in. When assemble the Distractor, keep the side with hex knob on the top.



- Hold the upper ends of the Counter Torques together as a pivot. Rotate the hex knob on the Distractor by using the Ratchet Wrench to perform distraction.



- Replace the Distractor with Compressor, and take the above steps to perform compression if needed.



Remove Rod Holder

- Before remove the Rod Holder, confirm with fluoroscopy that both ends of the rod have passed through screw saddles about 5mm.
- Insert the Rod Holder Screwdriver and rotate anticlockwise to loosen the clasp on the Rod Holder. Release the rod and remove the Rod Holder from body.



Final Tightening

- Over the screw long arms, slide the Counter Torque down to the rod. There are two ends of the Ratchet Wrench. Use the open end of the Ratchet Wrench to grasp the hex slot on the Counter Torque and hold it in place.

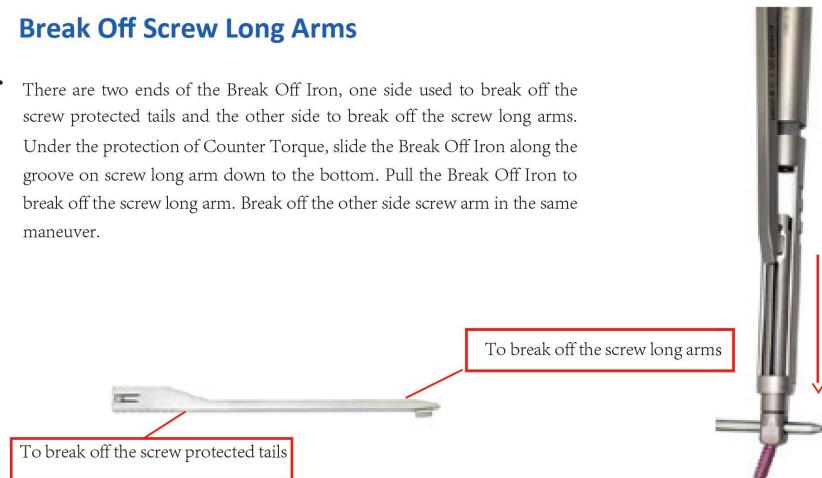


- Connect the Nuts Screwdriver to the Torque-limiting Handle, and then place the Nuts Screwdriver down through screw long arms. Rotate the Nuts Screwdriver to tighten the screw cap while holding the Counter Torque until Torque-limiting Handle clicks. Repeat the above steps as needed for the remaining screw caps.



Break Off Screw Long Arms

- There are two ends of the Break Off Iron, one side used to break off the screw protected tails and the other side to break off the screw long arms. Under the protection of Counter Torque, slide the Break Off Iron along the groove on screw long arm down to the bottom. Pull the Break Off Iron to break off the screw long arm. Break off the other side screw arm in the same maneuver.



- It is suggested to double tighten the screw cap using Torque-limiting Screwdriver after screw long arms are broken off. Repeat the above steps to break off remaining screws.

- Suggestion: it is suggested to prepare a G5 Multiaxial Screwdriver in case of need as the Cupid screw is similar to our G5 multiaxial screw or G5 Uni-plane screw after its long arms are broken off.



Implant Information

Cupid Multiaxial Reduction Pedicle Screw



Product Code	Size	Model No.
33461030	Ø5.6*30	G5 K02
33461035	Ø5.6*35	G5 K02
33461040	Ø5.6*40	G5 K02
33461045	Ø5.6*45	G5 K02
33461050	Ø5.6*50	G5 K02
33461055	Ø5.6*55	G5 K02
33462030	Ø6.1*30	G5 K02
33462035	Ø6.1*35	G5 K02
33462040	Ø6.1*40	G5 K02
33462045	Ø6.1*45	G5 K02
33462050	Ø6.1*50	G5 K02
33462055	Ø6.1*55	G5 K02
33463030	Ø6.6*30	G5 K02
33463035	Ø6.6*35	G5 K02
33463040	Ø6.6*40	G5 K02
33463045	Ø6.6*45	G5 K02
33463050	Ø6.6*50	G5 K02
33463055	Ø6.6*55	G5 K02
33464030	Ø7.1*30	G5 K02
33464035	Ø7.1*35	G5 K02
33464040	Ø7.1*40	G5 K02
33464045	Ø7.1*45	G5 K02
33464050	Ø7.1*50	G5 K02
33464055	Ø7.1*55	G5 K02

Cupid Uni-plane Reduction Pedicle Screw



Product Code	Size	Model No.
33470036	Ø6.1*36	G5 K03
33470041	Ø6.1*41	G5 K03
33470046	Ø6.1*46	G5 K03
33470051	Ø6.1*51	G5 K03
33471036	Ø6.6*36	G5 K03
33471041	Ø6.6*41	G5 K03
33471046	Ø6.6*46	G5 K03
33471051	Ø6.6*51	G5 K03



Cupid Screw Cap



Product Code	Model No.
33466000	G5 LD04

Cupid Rod



Product Code	Size	Model No.	Remark
33467050	Ø5.6*50	G5 B01	
33467055	Ø5.6*55	G5 B01	Pre-bent
33467060	Ø5.6*60	G5 B01	
33467065	Ø5.6*65	G5 B01	Pre-bent
33467070	Ø5.6*70	G5 B01	
33467075	Ø5.6*75	G5 B01	Pre-bent
33467080	Ø5.6*80	G5 B01	
33467085	Ø5.6*85	G5 B01	Pre-bent
33467090	Ø5.6*90	G5 B01	
33467095	Ø5.6*95	G5 B01	Pre-bent
33467100	Ø5.6*100	G5 B01	
33467105	Ø5.6*105	G5 B01	Pre-bent
33467110	Ø5.6*110	G5 B01	
33467115	Ø5.6*115	G5 B01	Pre-bent
33467120	Ø5.6*120	G5 B01	
33467125	Ø5.6*125	G5 B01	Pre-bent
33467130	Ø5.6*130	G5 B01	
33467135	Ø5.6*135	G5 B01	Pre-bent
33467140	Ø5.6*140	G5 B01	
33467145	Ø5.6*145	G5 B01	Pre-bent
33467150	Ø5.6*150	G5 B01	
33467155	Ø5.6*155	G5 B01	Pre-bent
33467160	Ø5.6*160	G5 B01	
33467165	Ø5.6*165	G5 B01	
33467250	Ø5.6*250	G5 B01	
33467400	Ø5.6*400	G5 B01	

Instrument Information

Product Code	Product Description	QTY.
109130	Guide Pin, 1.5mm	6
109150	Inner Dilator	2
109280	Outer Dilator	2
109370	Outer Sleeve, 60mm	1
109380	Outer Sleeve, 70mm	1
109390	Outer Sleeve, 80mm	1
109120	Awl Cannulated	1
109110	Tap Cannulated, Ø5.5mm	1
109260	Tap Cannulated, Ø6.5mm	1
109270	Handle With Quick Coupling, Cannulated	2
109460	Rod Bender	1
109190	Nuts Holder, elastic	2
109170	Rod Holder	1
109400	Rod Holder, long	1
109410	Rod Holder Screwdriver	1
109450	Torque-limiting Handle	1
109220	Break Off Iron	2
109430	Distractor	1
109440	Compressor	1
109420	Reducer	1
109200	Nuts Screwdriver	2
109180	Screwdriver	2
109350	Ratchet Wrench	2
109210	Counter Torque	2
109001	CUPID MIS Spine Instrument Set(empty)	1
109000	CUPID MIS Spine Instrument Set	1

109130

109150



109280



109370



109460



109190



109380



109390



109170



109400



109120



109110



109410



109450



109260



109270



109220



109430



109440



109420



109200



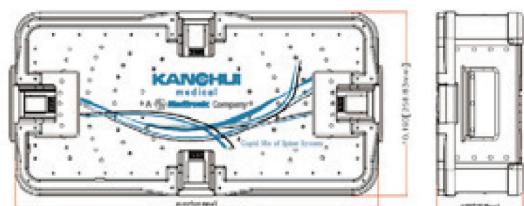
109180



109350



109210



109001
109000