In the 1980s Barclay Slocum reasoned that changing the angle of the tibial plateau would modify the forces acting upon the cruciate deficient stifle so that under load the stifle would be stable. Slobodan Tepic considered the Slocum model of stifle biomechanics too simplistic and factored in many other muscles and tendons acting on the stifle. He concluded that rather than correcting the tibial plateau to any arbitrary angle, the relationship of the tibial plateau to the straight patella ligament was more significant. According to his mechanical engineering theories, by making the angle between the tibial plateau and the patellar ligament / tendon to be 90 degrees, the resultant cranial thrust forces acting on the stifle were effectively neutralised when the stifle was loaded.

In the early 2000s, Tepic and Montavon in Zurich adapted a human procedure called the Maquet Procedure which advanced the tibial tuberosity until the angle between the patella ligament and the tibial plateau is 90 degrees. This procedure is known as Tibial Tubercle Advancement (TTA). Various recent modifications to the original technique including Modified Maquet Techniques including the TTA Rapid have been described.
Forked TTA plate
The first part of this step-by-step guide illustrated here describes the original TTA technique with the forked plate.

Screwed TTA plate
The second section describes the technique with the forkless (screwed) plate. This is arguably simpler, safer, and gives more flexibility for intra-operative adjustment.

Implants are available in either Titanium or 316LVM. Titanium offers better biocompatibility, fatigue strength, and higher resistance to infection.

Preoperative Assessment and Planning.
A well-positioned mediolateral view of the stifle at 135 degrees flexion is used to calculate the required tibial tuberosity advancement to bring the patellar tendon to be 90 degrees to the tibial plateau.

1. Tibial Advancement Calculation
The Tibial plateau “traditional method” identifies the axis of the tibial plateau and then perpendiculars are run from this onto the tibial tuberosity and the cranial aspect of the patella.
   a. The tibial plateau is identified and line B on the acetate placed to overlie it.
   b. A perpendicular is extended from this line to intersect the cranial aspect of the patella (line A).
   c. Another perpendicular is extended to intersect the cranial aspect of the tibial tuberosity at the point of insertion of the patellar tendon (line C).
   d. The perpendicular distance between lines A and C is the amount of advancement required = cage size to be used.
   e. Available cage size are from 3 to 15mm in 1.5mm increments.
   f. If in doubt, it is better to use a larger rather than smaller cage size.

2. Osteotomy Position – Planning
   a. The osteotomy should extend in a straight line from just cranial to the tibial plateau to the distal aspect of the tibial tuberosity.
   b. At its most proximal aspect, the osteotomy should occupy about 30-33% the cranio-caudal width of the tibia.

3. Plate Size Templating
   a. Using the acetate overlays or imaging planning software, an appropriate size TTA plate is selected.
   b. The plate should comfortably fit the tibial tuberosity and tibia the screw holes over the tibial diaphysis, considering the position of the osteotomy and the change in position of the tibial tuberosity after advancement.
   c. If in doubt between two sizes, it is better to use a smaller rather than larger plate.

Acetate overlays detailing how this is done are available from Vi, and on digital templating software such as Orthoview.
Initial approach and preparation of the tibia

1. Start with the dog in dorsal recumbency

2. Make a skin incision on the medial aspect of the stifle and proximal tibia starting at about the level of the patella, extending distally parallel and medial to the straight patellar ligament, over the medial tibial tuberosity and curving caudally to extend over the proximal tibial diaphysis.

3. Use diathermy and haemostats to control bleeding.

4. First sharp and then blunt dissect through the subcutaneous fascia and fat to expose the medial retinaculum and patellar ligament, the proximal tibial tuberosity, the caudal Sartorius muscle and its continuation distally as the pes anserinus.

5. Sharply dissect under the proximal cranial leading edge of the caudal sartorius muscle.

6. Using a periosteal elevator, insert under the caudal Sartorius and run distally against the medial tibia under the leading (insertion) edge of the pes anserinus.

7. As close to the tibia as possible, cut the insertion of the pes anserinus from the tibia using cutting diathermy or a #11 blade. Popliteus muscle and the medial collateral ligament are visualised beneath.
Prepare the tibial tuberosity on the medial aspect by reflecting and incising the periosteum cranially to expose the tibial tuberosity. This is best achieved by a combination of cutting diathermy, #11 blade and/or periosteal elevator. This soft tissue should be elevated and reflected sufficiently cranially until the following features are identified:

- the distal medial extent of the patellar ligament.
- the lateral curving surface of the cranial tibial tuberosity.
- the transversely oriented ligamentous tissue that is visualised at the distal aspect of the tibial tuberosity.

This elevation is continued just distal to the tibial tuberosity and a #11 blade is used to create a <2cm incision on the cranial aspect to allow elevation of the cranial tibial muscle.

Optional - a periosteal elevator is inserted into this hole and directed proximally – this is used to elevate the cranial tibial muscle from the lateral aspect of the proximal tibia.

On the medial aspect of the tibia, elevation is continued distally along the proximal tibial diaphysis to remove the periosteum from beneath the predicted position of the plate.

**Medial Stifle Arthrotomy**

Use sharp dissection (#11 blade of cutting diathermy) to make a parapatellar incision through the medial retinaculum a few millimetres medial to the patellar ligament. This incision should extend from the distal pole of the patella down onto the proximal tibia – distally this will join up with the previously exposed proximal cranial aspect of the tibial tuberosity.

Blunt dissection is used to separate the cut edges of the medial retinaculum from the underlying exposed joint capsule.
Starting proximally, at the level of the distal pole of the patella, sharp dissection (#11 blade or cutting diathermy) is used to incise into the joint capsule, initially entering the joint proximally; this releases a variable amount of fluid from the joint. The incision is continued distally as far as the proximal tibial tuberosity.

Stifle distractors are carefully inserted into the joint (to avoid damaging the menisci, articular cartilage or remaining cruciate ligament), rotated by 90 degrees and opened to distract the joint proximo-distally.

Gelpi retractors are placed medio-laterally to aid exposure.

Flush/ suction/ swabs are used to clean the joint and maximise visualisation.

The joint is inspected methodically so as to not miss important lesions. Specifically check:
- Lateral and medial femoral condyle articular cartilage for erosion/osteochondrosis.
- Cranial cruciate ligament for integrity – resect torn and damage parts.
- Caudal cruciate ligament – probe to check integrity/ damage.
- Lateral meniscus – visualise and probe for damage.
- Medial meniscus – visualise and probe for damage, use a Dandy Nerve Hook to probe above and below the meniscus to demonstrate tears. Resect damaged areas and tears using a small haemostat and #11 blade or Beaver blade.

The joint surgery/ inspection is now complete and the joint should be flushed thoroughly but not closed at this stage.

Return the dog to lateral recumbency.

Picking The Correct Plate Size And Position

Use the plate size originally predicted from templating.

Palpate the distinct tip of the most cranial part of the tibial tuberosity, just under the insertion of the patellar ligament.

Place the plate on the tibial tuberosity such that the most proximal hole/ fork of the plate is 5mm caudal to this tip of the tibial tuberosity.

Align the cranial aspect of the plate with the cranial cortex of the tibial tuberosity. Check that this position ensures that good quality bone is present beneath the most distal fork hole. If this is not the case, consider either a larger or a smaller plate.

If severe damage is present consider a partial meniscectomy, but only if necessary.
Check also that this plate position ensures that the plate screw holes are positioned over the mid to cranial tibial cortex. This is because when the tibial tuberosity advancement is performed, these screw holes migrate caudally – if they start too caudal and subsequently migrate further caudally they may no longer be positioned over the tibial cortex. Small adjustments in plate position and/or size may be necessary to ensure this. The plate should be as cranial as possible on the tibial tuberosity, only a few mm from the most cranial edge, with the intended fork position pointing slightly caudally.

Once you are happy with the plate size and positioning, contour the plate. The T-handle is used to hold the proximal plate and the oval plate bender for the distal plate. Most plates require a gentle bend and twist to match the shape of the tibia. It is better to use small increments rather than over-contouring and then having to correct – this is because Titanium is easily fatigued by repeated bending.

Place the TTA drill guide jig (with the holes pointing distally) over the tibia tuberosity in the same place as the plate was. Use a finger tip to feel the cranial cortex of the tibial tuberosity; the feet of the jig should be at the same level.

Use small and medium sized pointed bone holding forceps to immobilise the plate onto the tibial tuberosity.

Before drilling, double check that the position of the jig is correct - put the plate on top and assess its position.

Using a 2mm drill bit with flush and suction, drill the most proximal plate hole. Once drilled, place the anchor peg.
31 Drill the most distal hole, and place the anchor peg.

32 Drill the remaining holes.

33 Remove the pegs, the drill guide and the bone holding forceps.

Templating And Making The Tibial Osteotomy

34 Palpate and identify Gerdy’s tubercle on the proximolateral aspect of the tibial tuberosity - this is the protrusion at the cranial aspect of the fossa in which the long digital extensor tendon runs.

35 Place a K-wire (1.6mm for medium breed dog) vertically from medial to lateral at the most proximal aspect of the tibia / distal aspect of the stifle arthrotomy so that it exits laterally over Gerdy’s tubercle. Adjust if not correct. On the medial aspect the position of the K-wire now identifies the location of the proximal tibial tuberosity osteotomy.

36 Place the plate on the tibia overlying the holes that have been drilled. Using cutting diathermy or a bone scribe, mark on the cranial tibial cortex a point halfway between the most distal fork hole and most proximal screw hole. This marks the distal aspect of the tibial tuberosity osteotomy.

37 Using cutting diathermy or a bone scribe, mark on the medial tibia in a straight line from the K-wire proximally directing distally towards the mark on the cranial tibial cortex. As you approach the distal mark, make a gentle curve so that the cortical exit point is a few millimetres proximal to the mark on the cranial tibial cortex. This is to ensure that the osteotomy exits the cranial tibial cortex more proximally than the final position of the plate screw holes. This is to minimise the effect of having 2 stress risers in too close proximity.

NOTE - Check the osteotomy position against the pre-operative plan. At the level of the cranial tip of the tibial tuberosity/insertion point of the patellar tendon, the osteotomy should divide the tibia approximately 30% tibial tuberosity, 70% tibial diaphysis.
38. Remove the K-wire

39. Ensure that the tibia is parallel to the table (otherwise the osteotomy cut will not be straight). This can be achieved by placing lap sponges or swabs under the hock and/or asking an assistant to hold the foot.

40. Place Gelpi retractors in the stifle joint - to reflect the patellar ligament cranially away from the blade.

41. Place Gelpi retractors to reflect the elevated cranial tibial muscle.

42. Place the plate over the tibia and mark the point at which the plate no longer covers the osteotomy scribe line.

43. With plenty of flush and suction, use an oscillating saw to make the osteotomy along the pre-scribed line - the osteotomy should be monocortical proximally and bicortical distally for the section that will be covered by the plate. A narrower blade should be used to make the gentle curve of the osteotomy distally.

Placing The Plate And Forks

44. Once the osteotomy is completed bicortical distally and monocortical proximally, you are ready to place the plate.

45. Insert the forks into the plate – a subtle click should be appreciated.

46. Hand insert the forks into the prepared holes in the tibial tuberosity – the forks will go in about half the way.

47. Ensure that all periosteum is cleared from the distal tibia in the region underlying the distal plate.
Supporting the lateral aspect of the tibial tuberosity with fingers or some swabs and use the mallet and impacting tool to drive home the forks and plate onto the tibial tuberosity. The plate and fork should fit snugly and ideally with no residual movement. If a little bit of wiggle movement is still present, hit more with the mallet and impactor tools. If there is still mild instability, place a swab over the exposed fork and striking directly with a mallet.

Complete the osteotomy by making the cut bicortical proximally.

The tibial tuberosity will now be free and unstable.

Remove the Gelpi retractors.

Place the appropriate sized (previously calculated advancement) spacer in the osteotomy – frequently the tuberosity will rotate laterally along its long axis. Using suction and swab, use straight Mayo scissors to cut the fibrous tissue at the proximal lateral aspect of the osteotomy – do not do this blind for fear of cutting the long digital extensor tendon.

Once this soft tissue is released, the tibial tuberosity should advance easily without rotating laterally along its long axis.

Check (visualise or palpate with periosteal elevator) that the forks exit the lateral cortex of the tibial tuberosity.

Cage Assessment /Placement

Use the spreader to distract the osteotomy then use a depth gauge to measure the depth of the caudal cut surface of the tibia near to its most proximal aspect – this equates to the length of cage you need to the closest 3mm. If in doubt, use a shorter rather than a longer cage as the cage can become particularly prominent on the lateral aspect.
Having selected the cage, insert it into the proximal aspect of the osteotomy for a trial fit.

Remove the cage and using the oval plate bender, bend the caudal ear of the cage medially (outwards) and bend the cranial ear laterally (inwards).

Re-place the cage into the osteotomy, about 3mm distal to the most proximal aspect of caudal cut surface of the tibia.

If intending to harvest a bone graft, mark the level of the most distal aspect of the cage against the caudal cut surface of the tibia using diathermy or a bone scribe. Remove the cage.

Using Volkmann’s curette and via the caudal cut surface of the tibia for access, harvest cancellous bone from the tibia. Only harvest from a location below the intended position of the cage – hence the need to mark the cage position above.

Collect the bone graft in a blood soaked swab or a 5ml syringe or similar.

Place the cage in the correct position:
- (wide aspect proximal, narrow aspect distal).
- perpendicular to the cut surface of the tibia.
- most proximal aspect approx 3mm distal to the most proximal aspect of the cut surface of the caudal tibia.

Using a large pair of single point reduction forceps between the cranial aspect of the mid tibial tuberosity and an adjacent point on the caudal tibial, reduce and compress the advanced tibial tuberosity. This can be a bit fiddly and takes a bit of practice. The tibial tuberosity has a tendency to migrate proximally but this can be controlled by applying a combination of digital pressure and application of the bone holding forceps.
This end result should be:

- The distal aspect of the osteotomy should be snugly compressed.
- The distal screw holes should be over the mid to caudal tibial cortex.
- The cage should be proximal to the most proximal fork hole.
- The ears of the cage can be rotated to move its cranial screw hole as far as possible away from the proximal fork hole.

Using a 1.8mm drill bit, drill guide and depth gauge, drill and place the screw in the caudal cage hole. Aim at a reasonable angle caudo-distal to the fibular head. This will be a relatively long screw; approx 28mm in a Labrador. Place a self-tapping 2.4mm screw. Make sure you drive it sufficiently far that rides over the edge of cage and engages the ear correctly.

Using a 1.8mm drill bit and drill guide, place the cranial cage screw – aim as proximally and cranially as bone stock will allow. As the depth gauge frequently does not sit on ear correctly, this screw frequently ends up being too long therefore don’t add to measured length. Place 2.4mm self tapping screw.

Drill the most proximal plate hole (2.0mm drill bit for 5 hole plates and smaller, 2.5mm for 6 hole plates and large. Measure and place 2.7mm or 3.5mm self tapping screw as appropriate. Do not angle much as will not engage in plate hole correctly.

Place the most distal plate screw (2.5mm or 3.5mm as appropriate). Do not angle much as will not engage in plate hole correctly.
Finish And Close

68 Flush the entire surgical site thoroughly.

69 Optional - place harvested cancellous autograft (or allograft) at the osteotomy site proximal and distal to the cage and in the cage itself. This probably has a negligible effect on bone healing.

70 Close the joint capsule (3m PDS, simple continuous).

71 Close the medial retinaculum (3.5m PDS, simple continuous).

72 Starting distally, re-attach the pes anserinus to the elevated periosteum/soft tissue on the cranial aspect of the tibial tuberosity. This should be possible all the way proximally to include the caudal Sartorius muscle, and covering the implants most of the way (3.5m PDS, simple continuous). Occasionally it is not possible to close over the proximal plate and cage.

73 Close the subcutaneous fascia (3m PDS, simple continuous).

74 Close the subcutis (2m or 3m Monocryl, simple continuous).

75 Close the skin (staples, skin sutures etc.).

76 Take well positioned radiographs and check osteotomy position and reduction and implant position.
Post Operative Care

Post operative care of the TTA patient is critical. Until the osteotomy has filled and consolidated the tibia is vulnerable to fracture, and the implants vulnerable to fail.

- The patient is kept in hospital overnight on appropriate analgesia and is normally ready to be discharged the day after surgery.
- NSAIDs are typically given for 10-20 days.
- There is no indication for post-operative antibiotics.
- Strict cage rest plus strict lead walks only is started.
- Physiotherapy should start immediately.
- The patient is checked at 10 days and the skin staples/sutures removed.
- Hydrotherapy should start once the skin wound has healed ie at 10 days post-op.
- The patient is checked at 6-8 weeks and progress radiographs are taken.

If the 6-8 week radiographs show good progression of bone healing, exercise is gradually returned back to normal over the subsequent 6 weeks.

TTA Surgery – Surgical Technique

Forkless/ Screwed Plate

Forkless Plates

One evolution of the original Kyon TTA plate and technique is the development of the plate that uses screws rather than forks/tines in the tibial tuberosity. The screwed TTA plate has a number of advantages over the original forked plate including:

- The osteotomy is made in one simple step rather than two stages.
- Making an incomplete osteotomy distally creates a much more stable osteotomy construct for stabilisation. This is quicker and more easier to reduce and place implants.
- There is no Maquet hole, so no risk of Maquet hole associated fracture.
- There is more freedom for selection of plate position. This is because the screwed plate is placed after the osteotomy is complete and the cage is placed, as compared to the forked plate which is placed even before the osteotomy is complete.

- Screw direction can be adjusted by the surgeon whereas fork direction cannot.
- Screw length is altered as determined by the depth gauge but fork length cannot be altered.

Forkless TTA - Surgical Technique

Follow similar procedure to the forked TTA but with differences as outlined below:

Unchanged:
- Pre-operative radiographs including templating.
- Preparation for surgery.
- Surgical approach and proximal tibial exposure
- Arthrotomy, cruciate and meniscal inspection +/- debridement.
- Closure.
- Post-operative radiographs.
- Post-operative care and recovery.

Surgical steps that are different:
1. Mark intended osteotomy position on the proximal medial tibia.
2. Plate size and position – check relative to osteotomy position and tibial tuberosity.
3. Make the osteotomy – leave distal tibia cortex and periosteum intact.
4. At the proximal osteotomy, gradually and gently advance the tibial tuberosity.
5. Measure the depth of the proximal tibia using depth gauge, as per step 55.
6. Place cage of the appropriate size and depth; contour ears as appropriate.
7. Placed pointed reduction forceps just under the insertion point of the patellar ligament from cranial to caudal. This is to immobilise the tibial tuberosity and compress the osteotomy (onto the cage).
8. Place the cranial and caudal cage ear screws (2.4mm).
9. Place the plate in a good position, ensuring screws as far away from other screws/edge of bone/edge of osteotomy as possible.
10. Place screws in the tibial tuberosity and tibial diaphysis.
11. Flush and close.
The TTA Starter Kit includes:

**Instruments**
- TTA Drill Guide (4 Hole)
- TTA Drill Guide (8 Hole)
- TTA Fork Holder
- TTA Spreader + Inserts
- TTA Plate Bender
- TTA 2.4 Cross Head Screwdriver
- TTA Plate and Fork Overlay
- TTA Mallet
- Depth Gauge
- TTA Cage Forceps
- Block End Serrated Dissecting Forceps
- 2.5 Hex Head Screwdriver and Sleeve
- Premium Equipment Box
- 1.8mm, 2.0mm, 2.5mm Drill Bits - Hard

**Implants**
- One of each Cage (3, 4.5, 6, 7.5, 9, 10.5 & 12mm)
- One of each Fork
- One of each Plate
- 2.4mm Self Tapping Screws 12mm – 38mm 4 of each
- 2.7mm Self Tapping Screws 12mm – 28mm 3 of each
- 3.5mm Self Tapping Screws 16mm – 36mm 3 of each

The TTA Starter Kit gives a good saving over component price.

TTAPREM  TTA Starter Kit in a Premium Aluminium Box

**TTA Instrumentation**

The TTA procedure does require some essential instruments. Positioning of the fork and cage is impossible without the following instruments. The set is less expensive than buying the instruments individually.

TTA554  TTA Drill Guide (4 Hole)
TTA555  TTA Drill Guide (8 Hole)
TTA666  TTA Fork Holder
TTA444  TTA Spreader and 3, 6, 9, 12 & 15mm Inserts
TTA445  4.5, 7.5 & 10.5mm Insert Set
TTA333  TTA Plate Bender
TTA777  1.9mm Pins (Set of two)
001323  TTA Mallet (140g) 155mm
TTA999  TTA Saw Guide
TTAFCP  TTA Cage Forceps
001245SL  TTA Spinlock Reduction Forceps 180mm
DG243735  Depth Gauge for 2.4, 2.7 & 3.5 Screws
SDH910SPOMC  2.5mm Hex Screwdriver and Sleeve
H090208  1.8mm Drill Bit Hard
H090102  2.0mm Drill Bit Hard
H090112  2.5mm Drill Bit Hard
TTAPFO  TTA Plate and Fork Overlay
TTATAN  Common Tangent TTA/ MMT Advancement Overlay

**TTA Implants**

**TTA Cages**
- TTAC310  Cage 3 x 10mm Titanium Screw 2.4mm
- TTAC313  Cage 3 x 13mm Titanium Screw 2.4mm
- TTAC316  Cage 3 x 16mm Titanium Screw 2.4mm
- TTAC4512  Cage 4.5 x 12mm Titanium Screw 2.4mm
- TTAC4515  Cage 4.5 x 15mm Titanium Screw 2.4mm
- TTAC4518  Cage 4.5 x 18mm Titanium Screw 2.4mm
- TTAC616  Cage 6 x 16mm Titanium Screw 2.4mm
- TTAC619  Cage 6 x 19mm Titanium Screw 2.4mm
- TTAC622  Cage 6 x 22mm Titanium Screw 2.4mm
- TTAC7513  Cage 7.5 x 13mm Titanium Screw 2.4mm
- TTAC7516  Cage 7.5 x 16mm Titanium Screw 2.4mm
- TTAC7519  Cage 7.5 x 19mm Titanium Screw 2.4mm
- TTAC919  Cage 9 x 19mm Titanium Screw 2.4mm
- TTAC922  Cage 9 x 22mm Titanium Screw 2.4mm
- TTAC925  Cage 9 x 25mm Titanium Screw 2.4mm
- TTAC10519  Cage 10.5 x 19mm Titanium Screw 2.4mm
- TTAC10522  Cage 10.5 x 22mm Titanium Screw 2.4mm
- TTAC10525  Cage 10.5 x 25mm Titanium Screw 2.4mm
- TTAC10528  Cage 10.5 x 28mm Titanium Screw 2.4mm
- TTAC10531  Cage 10.5 x 31mm Titanium Screw 2.4mm
- TTAC1222  Cage 12 x 22mm Titanium Screw 2.4mm
- TTAC1225  Cage 12 x 25mm Titanium Screw 2.4mm
- TTAC1228  Cage 12 x 28mm Titanium Screw 2.4mm
- TTAC13522  Cage 13.5 x 22mm Titanium Screw 2.4mm
- TTAC13525  Cage 13.5 x 25mm Titanium Screw 2.4mm
- TTAC13528  Cage 13.5 x 28mm Titanium Screw 2.4mm
- TTAC13531  Cage 13.5 x 31mm Titanium Screw 2.4mm
- TTAC1522  Cage 15 x 22mm Titanium Screw 2.4mm
- TTAC1525  Cage 15 x 25mm Titanium Screw 2.4mm
- TTAC1528  Cage 15 x 28mm Titanium Screw 2.4mm
- TTAC1531  Cage 15 x 31mm Titanium Screw 2.4mm

**TTA Plates**
- TTAP2  Plate 2 Hole Titanium Screw 2.4mm
- TTAP3  Plate 3 Hole Titanium Screw 2.4 + 2.7mm
- TTAP4  Plate 4 Hole Titanium Screw 2.4 + 2.7mm
- TTAP5  Plate 5 Hole Titanium Screw 2.7mm
- TTAP6  Plate 6 Hole Titanium Screw 2.7 + 3.5mm
- TTAP7  Plate 7 Hole Titanium Screw 3.5mm
- TTAP8  Plate 8 Hole Titanium Screw 3.5mm

**TTA Forks**
- TTAF2  Fork 2 Prong Titanium
- TTAF3  Fork 3 Prong Titanium
- TTAF4  Fork 4 Prong Titanium
- TTAF5  Fork 5 Prong Titanium
- TTAF6  Fork 6 Prong Titanium
- TTAF7  Fork 7 Prong Titanium
- TTAF8  Fork 8 Prong Titanium

**TTA Forkless plates**
- TTAX2  Forkless TTA Plate (same length as TTAP3) 2.4+2.7 screw
- TTAX5  Forkless TTA Plate (same length as TTAP4) 2.4+2.7 screw
- TTAX6  Forkless TTA Plate (same length as TTAP5) 2.7 screw
- TTAX7  Forkless TTA Plate (same length as TTAP6) 2.7+3.5 screw
- TTAX9  Forkless TTA Plate (same length as TTAP7) 3.5 screw
- TTAX10  Forkless TTA Plate (same length as TTAP8) 3.5 screw
- TTAXSET  Forkless TTA Plate Set - one of each size

**TTA Forkless Plate Forceps**

Variant of the plate holding drill guide forceps design developed for thin TTA plates. Hold the plate in position allowing the pilot hole to be drilled through the guide in the correct position, even after the osteotomy has been made.

TTAFXCP  Forkless TTA Plate Forceps (145mm)
TTA Cuttable Cages

Cuttable cages can be trimmed in 3mm increments, to cover a larger range of patients, with a reduced inventory. Also available as a set of cages (one of each size) with a free cutter.

TTACUT16  Cuttable Cage 3 x 16mm  
TTACUT4618  Cuttable Cage 4.5 x 18mm  
TTACUT622  Cuttable Cage 6 x 22mm  
TTACUT7522  Cuttable Cage 7.5 x 22mm  
TTACUT926  Cuttable Cage 9 x 26mm  
TTACUT10526  Cuttable Cage 10.5 x 26mm  
TTACUT1228  Cuttable Cage 12 x 28mm  
TTACUT13528  Cuttable Cage 13.5 x 28mm  
TTACUT1532  Cuttable Cage 15 x 32mm  
TTACUT1  Cuttable Cage Set (9) with FREE Cage Cutters

TTA Cuttable Cage Cutter

TTA cage cutters, which have narrow jaws designed to fit between the fins of cuttable cages. These cutters are only for TTA cages – not suitable for other implants due to the specially designed slim jaws.

TTACACUT  TTA Cuttable Cage Cutter

TTA Washers

Stackable titanium washers. Permit adjustments in 1mm increments.

PW24TI  2.4mm TTA Washer - Titanium

TTA Spacer

Placed under either cranial or caudal cage lugs to help re-align the quadriceps mechanism in cases of concurrent patellar luxation while performing the TTA procedure. Suggested maximum tibial tuberosity movement is 50%.

Although more expensive individually than washers, spacers may result in a more stable construct.

TTASP2  TTA Spacer Titanium 2mm  
TTASP4  TTA Spacer Titanium 4mm  
TTASP6  TTA Spacer Titanium 6mm  
TTASP8  TTA Spacer Titanium 8mm

2.4mm Titanium Screws - Cruciate Head

TICS2408  Titanium 2.4 Self Tapping Cortical Screw 8mm  
TICS2410  Titanium 2.4 Self Tapping Cortical Screw 10mm  
TICS2412  Titanium 2.4 Self Tapping Cortical Screw 12mm  
TICS2414  Titanium 2.4 Self Tapping Cortical Screw 14mm  
TICS2416  Titanium 2.4 Self Tapping Cortical Screw 16mm  
TICS2418  Titanium 2.4 Self Tapping Cortical Screw 18mm  
TICS2420  Titanium 2.4 Self Tapping Cortical Screw 20mm  
TICS2422  Titanium 2.4 Self Tapping Cortical Screw 22mm  
TICS2424  Titanium 2.4 Self Tapping Cortical Screw 24mm  
TICS2426  Titanium 2.4 Self Tapping Cortical Screw 26mm  
TICS2428  Titanium 2.4 Self Tapping Cortical Screw 28mm  
TICS2430  Titanium 2.4 Self Tapping Cortical Screw 30mm  
TICS2432  Titanium 2.4 Self Tapping Cortical Screw 32mm  
TICS2434  Titanium 2.4 Self Tapping Cortical Screw 34mm  
TICS2436  Titanium 2.4 Self Tapping Cortical Screw 36mm  
TICS2438  Titanium 2.4 Self Tapping Cortical Screw 38mm  
TICS2440  Titanium 2.4 Self Tapping Cortical Screw 40mm

2.7mm Titanium Screws - Hex Head

TICS2706  Titanium 2.7 Self Tapping Cortical Screw 6mm  
TICS2708  Titanium 2.7 Self Tapping Cortical Screw 8mm  
TICS2710  Titanium 2.7 Self Tapping Cortical Screw 10mm  
TICS2712  Titanium 2.7 Self Tapping Cortical Screw 12mm  
TICS2714  Titanium 2.7 Self Tapping Cortical Screw 14mm  
TICS2716  Titanium 2.7 Self Tapping Cortical Screw 16mm  
TICS2718  Titanium 2.7 Self Tapping Cortical Screw 18mm  
TICS2720  Titanium 2.7 Self Tapping Cortical Screw 20mm  
TICS2722  Titanium 2.7 Self Tapping Cortical Screw 22mm  
TICS2724  Titanium 2.7 Self Tapping Cortical Screw 24mm  
TICS2726  Titanium 2.7 Self Tapping Cortical Screw 26mm  
TICS2728  Titanium 2.7 Self Tapping Cortical Screw 28mm  
TICS2730  Titanium 2.7 Self Tapping Cortical Screw 30mm  
TICS2732  Titanium 2.7 Self Tapping Cortical Screw 32mm  
TICS2734  Titanium 2.7 Self Tapping Cortical Screw 34mm  
TICS2736  Titanium 2.7 Self Tapping Cortical Screw 36mm  
TICS2738  Titanium 2.7 Self Tapping Cortical Screw 38mm  
TICS2740  Titanium 2.7 Self Tapping Cortical Screw 40mm

3.5mm Titanium Screws - Hex Head

TICS3514  Titanium 3.5 Self Tapping Cortical Screw 14mm  
TICS3516  Titanium 3.5 Self Tapping Cortical Screw 16mm  
TICS3518  Titanium 3.5 Self Tapping Cortical Screw 18mm  
TICS3520  Titanium 3.5 Self Tapping Cortical Screw 20mm  
TICS3522  Titanium 3.5 Self Tapping Cortical Screw 22mm  
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TICS3536  Titanium 3.5 Self Tapping Cortical Screw 36mm  
TICS3538  Titanium 3.5 Self Tapping Cortical Screw 38mm  
TICS3540  Titanium 3.5 Self Tapping Cortical Screw 40mm

TTA Screwbox

SHTTA242735  TTA Screwbox for 2.4mm, 2.7mm & 3.5mm Titanium Screws

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