

Fusion Implants

Advanced Veterinary Devices



TPLO

Tibial Plateau Leveling Osteotomy



APPLICATION NOTES

Fusion Implants TPLO plates

- Plate shape based on “post-TPLO” bone shape.
- Plate sizes based on sample populations clustered by ideal blade size.
- Choose the plate that matches the radius of the osteotomy.
- To account for individual variations, note the flexibility to use a plate one size smaller or larger than the osteotomy.
- **Material:** medical-grade Ti-6Al-4V, 3D printed, heat-treated, CNC-machined, anodised; rigorous quality checks.
- **Additional features:** osteotomy laser mark as a guide for plate positioning, temporary fixation holes to accommodate k-wires or “stay-fix” pins.
- **Sizes & screw kits:** select size and locking/cortical screw diameters and driver (T6/T8/T10) per Fusion's compatibility table.



Preoperative planning

- Indication & goal**

Target a postoperative TPA approximately 5°.

- Aim to centre the osteotomy on the apex of the tibial intercondylar eminence. If deviation from this centering is preferred for practical purposes, consider over- or under-estimating the degree of rotation required.

- Imaging & measurements**

- Acquire orthogonal stifle radiographs; ensure true lateral positioning (superimposed femoral/tibial condyles) to avoid TPA over-/ under-estimation. Measure pre-operative TPA carefully.
- Choose **osteotomy blade radius** and **Fusion TPLO plate size** together; Fusion plates are designed to correspond to the blade radius used.

- Implant & screw selection (Fusion)**

Screw compatibility:

- TPLO 12 (2.0):** 2.0 mm locking & cortical, T6 driver
- TPLO 12 (2.4):** 2.4/2.7 mm locking & cortical, T8 driver
- TPLO 15:** 2.4/2.7 mm locking & cortical, T8 driver
- TPLO 18/21/24/27:** 3.5 mm locking & cortical, T10 driver

Plate compatibility table

Plate	Blade	Secondary Blade Size	Suggested BW	Cortical Screw	Cortical Screw Drill Bit	Locking Screw	Locking Screw Drill Bit	Screw Driver
12 (2.0mm)	12	10	4-7	2	1.5	2	1.5	T6
12 (2.4mm)	12	10, 15	6-11	2.4	1.8	2.4/2.7	1.9	T8
15	15	12, 18	11-20	2.7	2	2.7	2.1	T8
18	18	15, 21	15-24	3.5	2.5	3.5	2.9	T10
21	21	18, 24	18-26	3.5	2.5	3.5	2.9	T10
24	24	21, 27	20-35	3.5	2.5	3.5	2.9	T10
27	27	24, 30	32-65	3.5	2.5	3.5	2.9	T10
30	30	27	50-100+	4.5	3.2	4.0/5.0	3.2/4.3	T25

Arthrotomy

Whilst it is at the surgeon's discretion, we recommend stifle arthrotomy and careful visual and tactile inspection of the menisci, especially the medial meniscus, and debridement of unstable meniscal flaps.

Osteotomy planning & execution: Abridged surgical technique

1. Jig

- Use of standard TPLO jig technique at the surgeon's discretion.

2. Careful execution of pre-operative plan and osteotomy centering using standard or adapted D1, D2 and D3 measurements at the surgeon's discretion

3. Radial osteotomy

- Perform a radial cut centered appropriately, using the preselected blade radius that matches your Fusion plate choice.
- Consider the use of the Fusion osteotomy guides to minimise blade slippage and to protect the patellar tendon.
- Make rotation marks before osteotomy is completed.

4. Rotation

- Rotate and stabilise the proximal segment to achieve the planned TPA ($^{\circ}$ target);
- Check for neutralised tibial thrust.



Plate selection & placement (Fusion TPLO)

1. Confirm plate size & laterality (Left/Right) based on plan;
Fusion sizes available: **12/2.0, 12/2.4, 15, 18, 21, 24, 27, 30.**

2. Contour

- Fusion plates are **anatomically contoured** and incorporate some proximal stand off to account for typical “medial buttress”.
- If there is a large amount of medial buttress, consider debriding this by marking the cranial limit of the desired plate position, and removing excessive soft tissue whilst avoiding damage to the medial collateral ligament and joint capsule.
- Plates can be contoured if required. Beware the following factors: a bench top style plate bender might be required to bend large plates; the locking screw angles are fixed, so be aware of the screw trajectory and relative position of the proximal tibial joint surface. Consider a shorter screw in position 1 if necessary.

3. Proximal placement

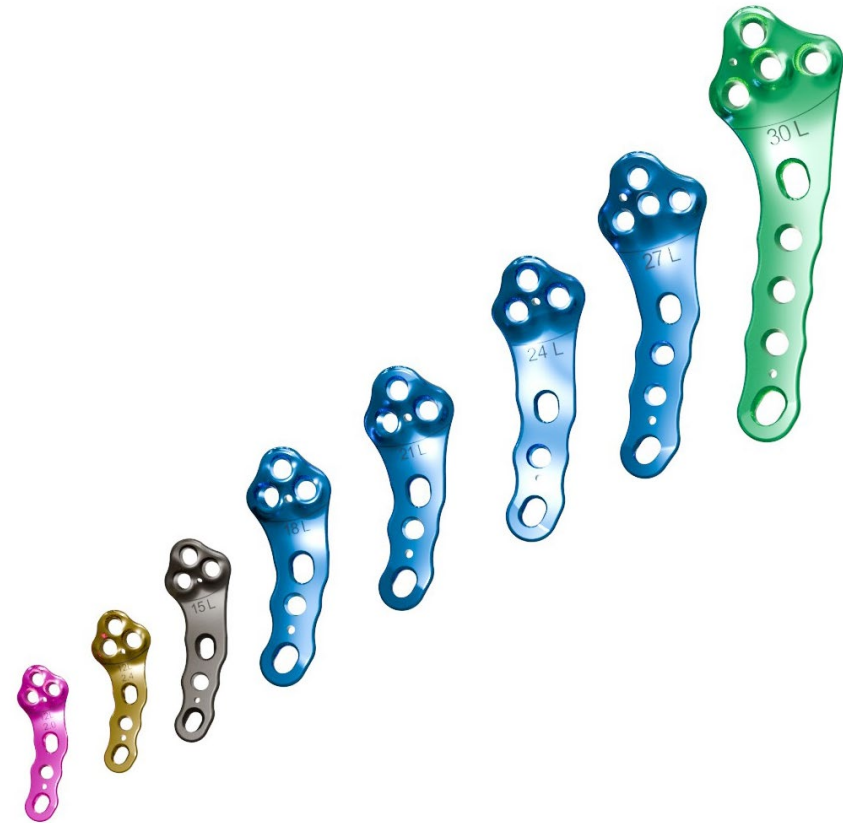
- Use the laser mark on the plate as a guide to help ensure that all screw holes overlie the proximal fragment. Note that individual anatomic and technique variation means that the laser mark will not perfectly superimpose over the osteotomy in every case.
- Use a 25g needle to identify the proximal limit of the tibia by “walking” it proximally, just cranial to the MCL.

4. Provisional fixation

- K-wire/ Stay-Fix pin holes are present proximally and distally if this is your preferred technique. It is generally recommended to place the proximal temporary fixation pin first. If using a stay-fix pin, take care not to fully compress the proximal plate against the bone if this results in lifting of the distal end of the plate.

Screw strategy

Fusion TPLO Plates up to size 24 have 3 locking screw holes proximally, and 2 x dynamic compression holes and 1 x locking holes in the distal segment. Sizes 27 and 30 have 4 locking screw holes proximally, and 2 x dynamic compression holes and 2 x locking holes distally. Note that it is important that the distal end of the plate sits flush against the cortex, as the dynamic screws will compress the plate to the bone. Proximally, all the screws are locking, so some stand-off from the bone is acceptable.



A typical sequence (adapt to individual case):

- 1. Proximal fixation first:** insert two **locking** screws in the proximal segment. If using temporary fixation pins, the sequence of proximal screw placement is not critical, but we would generally advise to have at least one of the most cranial or the most proximal screws in position before compressing the osteotomy.
- 2. Distal shaft fixation:** place cortical screws in the loaded position (distally) in the dynamic compression holes.
 - a. Place each of these screws so that the screw head just contacts the plate.
 - b. If you have used temporary fixation pins, remove these now so that the distal one does not hinder compression.
 - c. Tighten the two dynamic compression screws sequentially - approximately a quarter-turn at a time, alternating between the two screws. This ensures the rotational compression of the osteotomy, centring compression in the middle of the osteotomy, rather than preferentially compressing distally, whilst leaving the cranial part less compressed.
 - d. Add all remaining locking screws in any sequence to complete the hybrid construct.

Closure

- Lavage if preferred;
- Careful closure/ reattachment of the *pes anserinus*.
- Routine layered closure of fascia/subcutis/skin. Application of dressing as per surgeons preference.

