MicroLift® – T

Translation Fixator — Smart Fixator® System

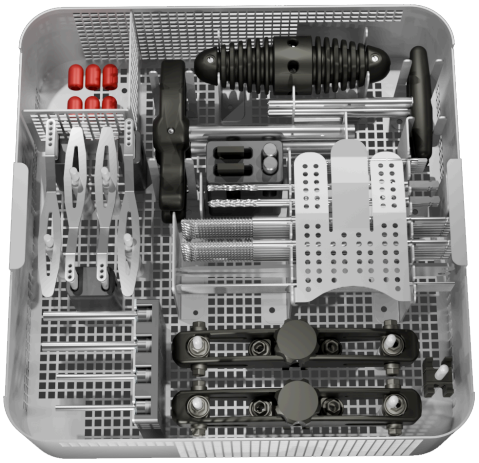
Surgical Technique & Ordering Information



RESPONSE ORTH

Response Ortho is a global orthopaedic trauma solutions manufacturer offering premium products created under its founding principles of innovation, excellence by design and functional superiority

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Introduction

The MicroLift® Translation Fixator is a component of the Response Ortho Smart Fixator® – Hexapod System. MicroLift® provides controlled, single-axis transverse translation of a bone segment. It can be applied to a cortical bone flap of the tibia or to a segment of the fibula, and is used within the indications for use of the Smart Fixator® – Hexapod System.

This guide describes its indications, the system, the surgical technique and the ordering information. The fibular application is described in the MicroLift® F guide.

Indications for Use

MicroLift® T is a component of the Smart Fixator® Circular and Hexapod Fixator System. It is suitable for hybrid use, combined with a circular or hexapod frame, and for individual use.

MicroLift® T is used within the indications for use of the Smart Fixator® – Hexapod System (FDA 510(k) K263083).

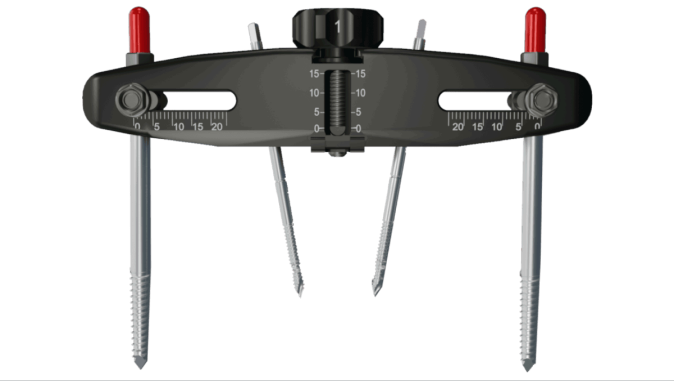
Within these indications, MicroLift® T is designed for tibial corticotomies and transverse tibial transport.

For the complete indications for use and the surgical technique of the frame, refer to the Smart Fixator® – Hexapod System surgical technique.

Prescription use only.

Contraindications

- Inability or unwillingness to follow postoperative instructions
- Active, uncontrolled systemic infection
- Severe proximal arterial inflow insufficiency
- Poor patient compliance
- Osteoporosis severe enough to compromise fixation stability



MicroLift® in the Smart Fixator® System

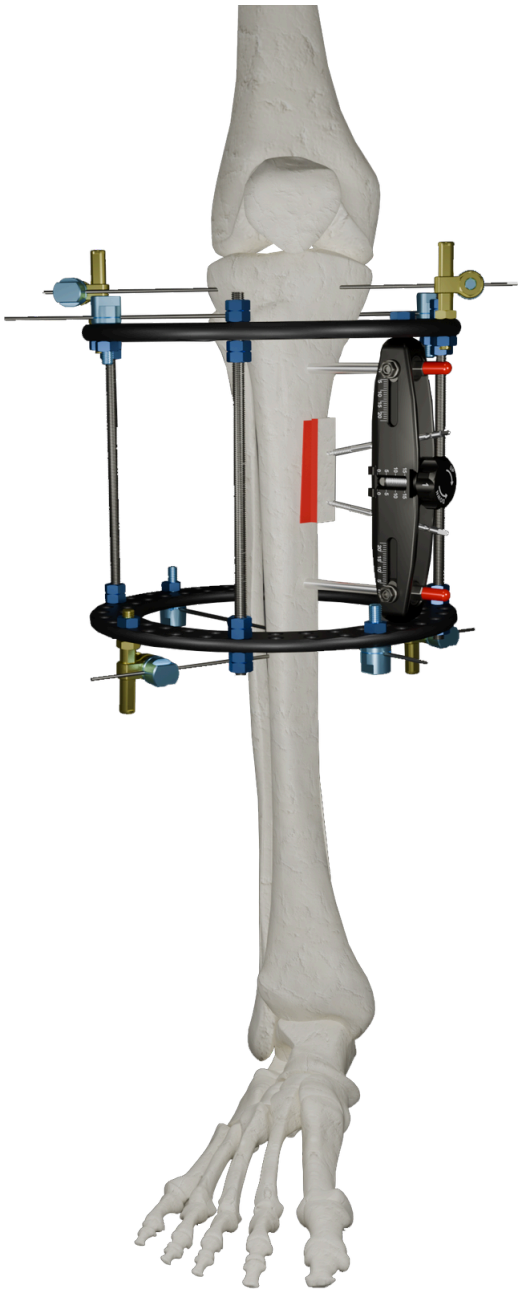
MicroLift® provides controlled, single-axis transverse translation of a bone segment. It can be applied to a cortical bone flap of the tibia or to a segment of the fibula, and is used within the indications for use of the Smart Fixator® – Hexapod System (page 4).

On Its Own

MicroLift is fixed to the tibia with its own pins: the transport module with two 3.0 mm transport half pins and the device body with two 5.0 mm tibial shaft half pins.

With Smart Fixator Components

MicroLift is mounted together with Smart Fixator rings and struts when the treatment also needs a circular or hexapod frame, within the system's indications for use (page 4).



MicroLift mounted with Smart Fixator rings.

System Overview

The MicroLift body is a closed transport housing that minimizes mechanical play along a predefined linear distraction axis, with a 15 mm maximum transport capacity. A ratchet mechanism advances the transport segment 0.25 mm per click and locks automatically after each increment; UP/DOWN markings and a numbered indicator (1–4) let the patient track daily progress under the treating physician's prescribed rate.

Fixation

- Transport segment: 3.0 mm half pins in a converging V-shaped configuration (unicortical), for construct stiffness
- Tibial shaft: 5.0 mm half pins (bicortical)

Bone Flap Template Plate

1.5 × 5.0 cm, with two holes for temporary K-wire fixation, a central threaded hole for the spacer bar, and two holes for inferior transport half-pin insertion.

Instrumentation

Part No	Description
00-1901-00	Corticotomy Template
00-1901-01	Threaded Spacer Bar
00-7040-00	5.0 mm Osteotome
00-3201-01	Quick Release Drill Bit, 2.0mm, Short
00-3281-02	2.8mm Drill Bit
00-1902-03	Multi-hole Drill Guide, 3-Hole
00-1902-05	Multi-hole Drill Guide, 5-Hole
00-1902-20	2.0 mm Drill Guide
00-1902-28	2.8mm Drill Guide
50-5017-11	T-handle (for 3.0 mm half pins)
00-1043-00	Multiple T-Handle (for 5 mm half pins)
00-1903-00	T-handle for Locking Nuts

Full ordering information, page 14.

Mechanical Design

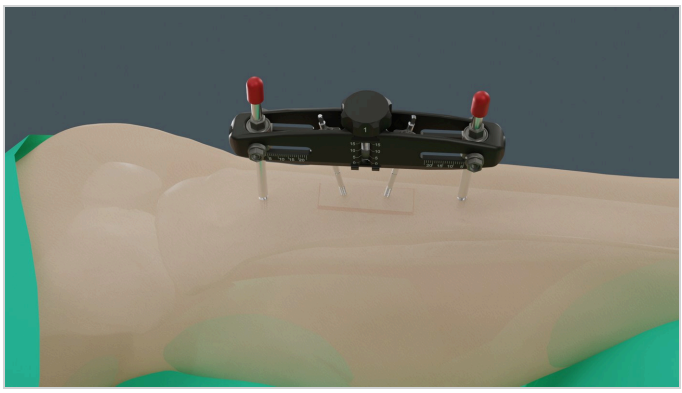
Controlled transverse transport depends on accurate single-axis motion, stable fixation of the cortical segment, a controlled rhythm, and avoiding rotational displacement, stress concentration or pin pull-out.

MicroLift's Design

- Closed transport housing, minimizing mechanical play
- Predefined, single-axis distraction path
- Converging V-shaped transport pins for construct stiffness
- Minimally invasive application — 6 small incisions

In a biomechanical study of a monolateral fixator model, converging pin pairs formed the stiffest construct (composite bone model; not clinical data of this device)[1].

1. Klemeit A, Weber A, Bourauel C, Welle K, Burger C, Schildberg FA, Deborre C. The influence of sagittal pin angulation on the stiffness and pull-out strength of a monolateral fixator construct. *Bioengineering.* 2023;10(8):982. doi:10.3390/bioengineering10080982



MicroLift assembled on the tibia — closed housing, single distraction axis, V-shaped transport pins.

Transverse Transport and Collateral Circulation

The publications below describe tibial cortex transverse transport (TTT) as a surgical technique. They are not clinical data for MicroLift, and their study populations are outside the FDA-cleared indications for use (page 4).

Biological Basis

The Ilizarov tension-stress principle: gradual mechanical distraction of living tissue stimulates tissue genesis, including new vessel formation.

Ilizarov GA. The tension-stress effect on the genesis and growth of tissues: Part I. *Clin Orthop Relat Res.* 1989;(238):249–281.

Tibial Cortex Transverse Transport

TTT moves a proximal medial tibial cortical segment transversely, by gradual distraction and then return. An expert consensus on the technique was published by the Chinese Association of Orthopaedic Surgeons.

Hua Q, Zhang Y, Wan C, et al., on behalf of the CAOS Taskforce Group. *J Orthop Translat.* 2020;25:11–16. doi:10.1016/j.jot.2020.05.003

Collateral Circulation after TTT

In a prospective series of 15 cases (14 patients) with infrapatellar ischemic lesions not eligible for revascularization, arteriography at 6–12 months showed increased collateral circulation in 12 of 15 cases (80%).

Rodrigues FL, França GUS, da Silva JB, et al. Tibial cortex transverse transport: a promising alternative for critical ischemic infrapatellar lesions. *J Hum Growth Dev.* 2025;35(3). doi:10.36311/jhgd.v35.18276

Preoperative Planning

Patient Selection and Assessment

- Confirm the indication and that none of the contraindications on page 4 applies
- Vascular assessment
- Infection control
- Confirm that the patient can follow the postoperative instructions, including the daily adjustments

Planning the Corticotomy

The corticotomy window is planned on the medial proximal tibia, approximately 5 cm distal to the tibial tuberosity, and the template position and incisions are marked on the skin (Operative Technique, step 1). The device offers a maximum transport of 15 mm.

Equipment Required

Provided by the surgical center:

- C-arm fluoroscope — position, pin depth and alignment are confirmed under fluoroscopy
- Power drill for the 2.0 mm and 2.8 mm drill bits
- Mallet for the osteotome
- Pin cutter

The MicroLift instruments and implants are listed in the Instruments Used box of each step and in Ordering Information, page 14.

Operative Technique

1. Template Positioning & Skin Marking

Identify the corticotomy level, approximately 5 cm distal to the tibial tuberosity, and plan a medial proximal tibial window. Align the corticotomy template parallel to the tibial crest and centered over the medullary canal, so that the flap is free once the corticotomy is complete (Figure 2). Place it with its UP marking facing up (away from the skin) and thread the spacer bar into it (Figure 1). Fix it with two 1.8 mm K-wires through the near cortex only (Figure 3). Mark the planned incisions. **Confirm position under fluoroscopy — mandatory.**

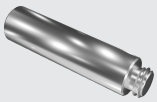


INSTRUMENTS USED

00-1901-00	Corticotomy Template
00-1901-01	Threaded Spacer Bar
40-4181-20	Guide Wire, 1.8mm x 200mm, Trocar

2. Placement of the Transport Module

Slide the transport module over the K-wires and maintain its position with the threaded spacer bar between the template and the module (Figure 4).



INSTRUMENTS USED

00-1901-01	Threaded Spacer Bar

3. Transport Segment Pin Insertion

Through the module's pin holes, drill unicortical holes for the inferior transport pins with the 2.0 mm guides and drill bit, aligning the distal pin path with the template plate's holes. Insert the first 3.0 mm transport half pin unicortically and confirm depth under fluoroscopy, then the second pin. Provisionally tighten the fixation bolts (Figure 5).

* ***Important Note:*** Unicortical fixation only — do not penetrate the posterior cortex. While inserting the pins, loosen the fixation bolts by only 1–2 turns; never remove them fully.

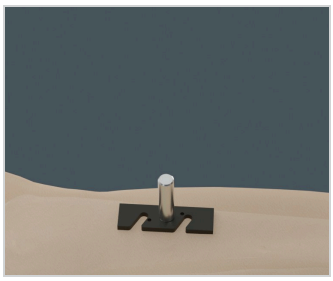


Figure 1. Template, UP marking up, spacer bar threaded in

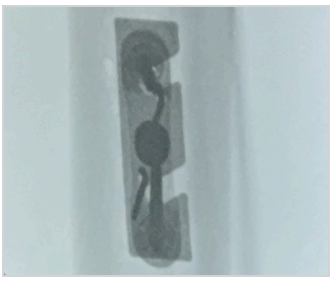


Figure 2. Fluoroscopy: template centered over the canal

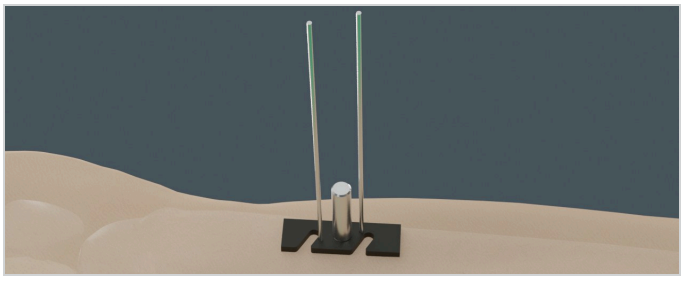


Figure 3. Template fixed with two K-wires

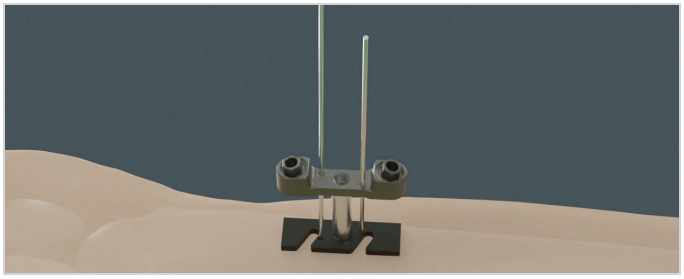


Figure 4. Transport module slid over the K-wires, spacer bar between template and module

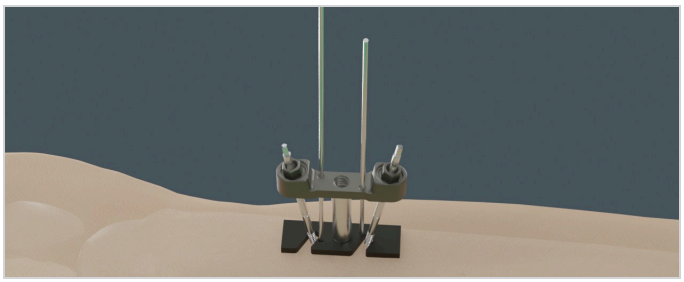


Figure 5. Transport half pins inserted through the module



INSTRUMENTS USED

00-1902-20	2.0 mm Drill Guide
00-3201-01	Quick Release Drill Bit, 2.0mm, Short
50-1083-83	Half Pin, 3.0/80/30mm, Trocar, SS
50-5017-11	T-handle (for 3.0 mm half pins)
00-1903-00	T-handle for Locking Nuts

4. Corticotomy

Outline the corticotomy window with a 2.0 mm drill through the guide (3-hole or 5-hole), angulating the holes approximately 3–4° to create a trapezoidal segment. Angle the drill toward the canal so the walls slope inward: the segment opens into the medullary canal and reseats easily. Two incisions are made along each long side of the guide and one at each short side (six in total); the drill guides are angled through these incisions to drill holes along the entire perimeter, using a minimally invasive technique and avoiding thermal necrosis. Carefully connect the drilled holes with the osteotome to free the flap (Figures 6–7). Gently confirm segment mobility under an internal-rotation view.



INSTRUMENTS USED

00-1902-03	Multi-hole Drill Guide, 3-Hole
00-1902-05	Multi-hole Drill Guide, 5-Hole
00-3201-01	Quick Release Drill Bit, 2.0mm, Short
00-7040-00	5.0 mm Osteotome

5. MicroLift® Device Engagement

Engage the threaded rod through the transport module's threaded hole with the UP/DOWN knob. Apply the plastic safety clip into the fixator body's grooves to prevent unintended disengagement (Figure 8). The clip is part of the device assembly.

6. Tibial Shaft Stabilization

Using the 2.8 mm guide, drill bicortically through the external fixation holes and insert the 5.0 mm half pins (proximal and distal); confirm bicortical purchase under fluoroscopy and provisionally tighten the bolts (Figure 8). Perform an acute 5 mm transverse distraction, then return to neutral, and confirm alignment under fluoroscopy. Trim excess pin length and cap with the plastic pin cover to prevent soft-tissue irritation and contralateral-limb contact.

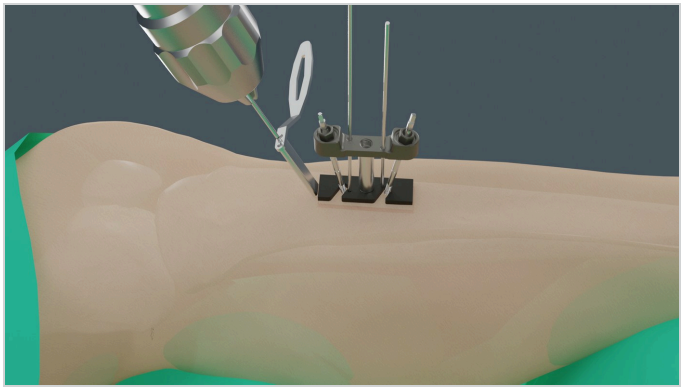


Figure 6. Drilling the corticotomy outline through the multi-hole drill guide, angled toward the canal

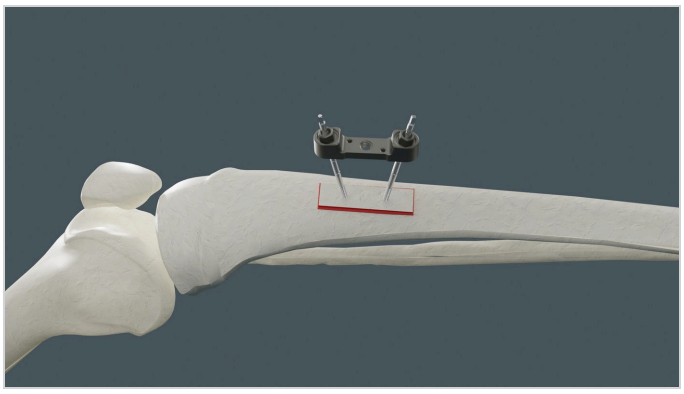


Figure 7. Corticotomy window: the freed transport segment on its pins

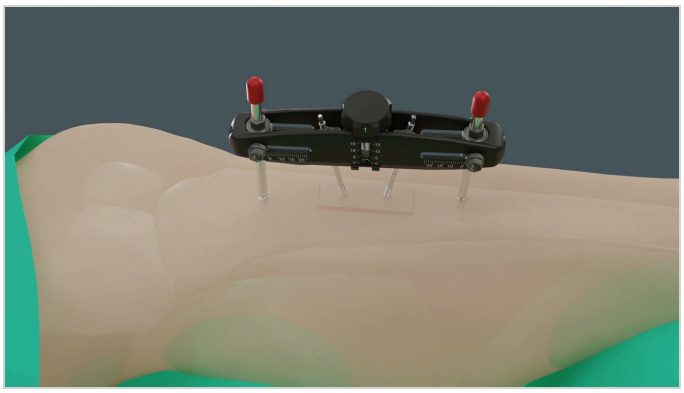


Figure 8. MicroLift engaged; shaft half pins trimmed and capped



INSTRUMENTS USED

00-1902-28	2.8mm Drill Guide
00-3281-02	2.8mm Drill Bit
50-1085-1540B	Half Pin, 5.0/150/40mm, Blunt, SS
50-1085-1550B	Half Pin, 5.0/150/50mm, Blunt, SS
00-1043-00	Multiple T-Handle (for 5 mm half pins)
55-1070-06	Pin Covers, 5mm

Postoperative Protocol

Phase	Schedule
Latency	7 days
Distraction	0.25 mm × 2/day (0.5 mm/day), 28 days
Rest	3 days
Compression (reverse transport)	up to 1 mm/day (0.5 mm twice daily), ~14 days
Frame removal	2 weeks after the compression phase is complete

The 7-day latency and 0.5 mm/day distraction follow the schedule of an experimental study of distraction osteogenesis (rat tibial lengthening; not clinical data of this device)[1].

Monitoring

- Skin evaluation
- Pin-site care
- Regular clinical and radiographic follow-up

1. Choi IH, Ahn JH, Chung CY, Cho TJ. Vascular proliferation and blood supply during distraction osteogenesis: a scanning electron microscopic observation. *J Orthop Res.* 2000;18(5):698–705. doi:10.1002/jor.1100180504

Complications & Risk Management

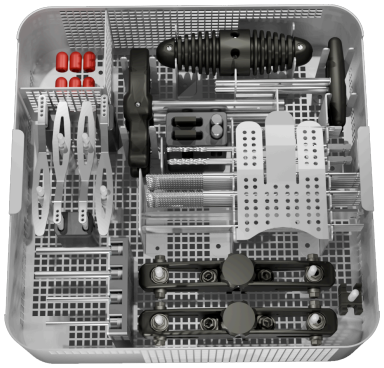
Potential complications include pin-site infection, cortical flap instability, premature consolidation, incomplete transport and tibial fracture (rare).

Risk Mitigation

- **Preoperative:** vascular assessment, infection control, patient selection
- **Intraoperative:** correct corticotomy level, controlled drilling, stable fixation
- **Postoperative:** protocolized distraction, routine follow-up, multidisciplinary care

Removal

1. Loosen the transport module fixation bolts
2. Remove the inferior transport pins
3. Loosen the side-lock nuts and shaft pin locking nuts
4. Remove the device body
5. Remove the tibial shaft half pins
6. Standard pin-site care



	Device	
50-1900-02	MicroLift Translation Fixator	
	Half Pins	
50-1083-83	Half Pin, 3.0/80/30mm, Trocar, SS	
50-1085-1540B	Half Pin, 5.0/150/40mm, Blunt, SS	
50-1085-1550B	Half Pin, 5.0/150/50mm, Blunt, SS	
	Guide Wires	
40-4181-20	Guide Wire, 1.8mm x 200mm, Trocar	

	Instrumentation	
00-1901-00	Corticotomy Template	
00-1901-01	Threaded Spacer Bar	
00-7040-00	5.0 mm Osteotome	
	Drill Bits	
00-3201-01	Quick Release Drill Bit, 2.0mm, Short	
00-3281-02	2.8mm Drill Bit	
	Drill Guides	
00-1902-03	Multi-hole Drill Guide, 3-Hole	
00-1902-05	Multi-hole Drill Guide, 5-Hole	
00-1902-20	2.0 mm Drill Guide	
00-1902-28	2.8mm Drill Guide	
	Handles	
50-5017-11	T-handle (for 3.0 mm half pins)	
00-1043-00	Multiple T-Handle (for 5 mm half pins)	
00-1903-00	T-handle for Locking Nuts	
	Pin Covers	
55-1070-06	Pin Covers, 5mm	

MicroLift® T

Surgical Technique & Ordering Information

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