

Early Safety Report on the Novel Multi-Directional Tibial Tubercle Transfer System (MD3T™) for Tibial Tubercle Osteotomy: A Cohort Study

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Disclosures

Dr. Sherman holds committee positions for AANA, AAOS, ACLSG, AOSSM, Biologic Association, ICRS, and ISAKOS. He is on the editorial board for the Arthroscopy Journal, Cur Rev Musc Med, and VJSM. He is a course chair of ISMF and the PFF Masters Course and a member of the AO Sports Medicine Taskforce. Dr. Sherman is a paid educational consultant for Arthrex, Depuy, Flexion, JRF, Kinamed, LifeNet, NewClip, and Smith & Nephew. He is a paid advisory board member for Bioventus, Icarus, Osteosys, Reparel, Sarcio, Sparta Medical, Vericel, and Vivorte. Dr. Sherman is on design teams and receives royalties from ConMed and DJO. Dr. Sherman holds stock options for Osteosys, Sarcio, Reparel, and Vivorte.

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BACKGROUND

Tibial tubercle osteotomy (TTO) is a powerful tool for addressing malalignment in a variety of patellofemoral disorders. Classic TTO techniques such as the Elmslie-Trillat¹, Fulkerson AMZ², and distalization type TTO have a longstanding track record but can be technically challenging with steep learning curve and complication profile. A novel multi-directional TTO system (MD3T) helps the surgeon perform 1-3 plane corrections with precision, modularity, reproducibility, and efficiency. This paper reports early clinical and radiographic safety outcomes of the MD3T technique.

OBJECTIVE

This prospective cohort study aims to describe the early safety data of a single surgeon performing TTO surgery with the Multi-Directional Tibial Tubercle Transfer System (MD3T™) system.

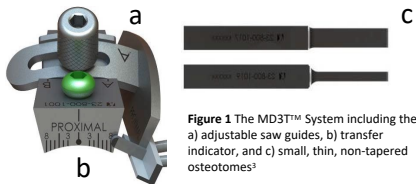


Figure 1 The MD3T™ System including the a) adjustable saw guides, b) transfer indicator, and c) small, thin, non-tapered osteotomes³

METHODS

- 39 TTO procedures performed using the MD3T™ system (KINAMED INCORPORATED, USA) in skeletally mature patients
- Electronic medical records were reviewed for:

- demographic data
- osteotomy type
- intra-operative findings
- complications including re-operation and revision

Figure 2 (Below, from left to right) MD3T™ System primary guide placement, 2nd (medial) cut setup with outrigger, and primary wedge⁴.

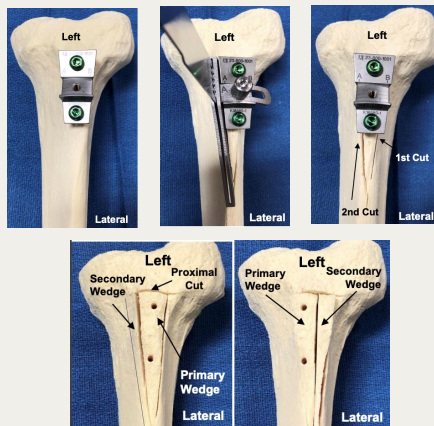
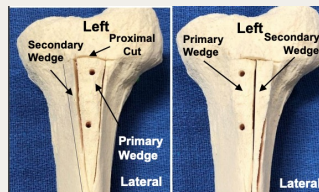


Figure 3 (Above) primary and secondary wedges freed and transposed⁴.



RESULTS

Patient Demographic Data

Total Knees	39	
Total Participants	36	
Gender	Female	25
	Male	11
Mean Age (range)	28.6 years (16-69)	
Reason for Operation	Pain	12
	Instability	11
	Both	16
Type of TTO Performed	Anteriorization	4
	Anteromedialization	22
	Medialization + Distalization	3
	Anteromedialization + Distalization	9
	Anteromedialization + Proximalization	1
Mean Follow Up	14.7 months	

- No cases of revision surgeries due to fracture or non-union.
- No patient developed deep vein thrombosis (DVT).
- No cases of proven infection that required surgical intervention for wound complication or deep infection.
- One case (3%) of hardware removal combined with surgical lysis of adhesions due to stiffness.
- 5 cases (13%) of superficial wound erythema noted within two weeks of surgery, treated with oral antibiotics.

CONCLUSION

Early surgical experience using the MD3T™ system for TTO surgery is encouraging. Regardless of the etiology or the type of translation performed, the preliminary results yield good safety outcomes and low complication rates at short and midterm follow-up.

Limitations:

- Single center, single surgeon
- Patient reported outcomes to be presented in longer term follow-up



Figure 4 (Left) Post operative lateral view x-ray showing osteotomy fixation and screw placement. (Right) Post operative A/P view x-ray showing osteotomy fixation and screw placement.



References

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2. Fulkerson JP. Anteromedialization of the tibial tuberosity for patellofemoral malalignment. *Clin Orthop Relat Res.* 1983; (177):176-181.
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4. Merchant, A. *MD3T Surgical Technique Guide.* (2021) Kinamed Incorporated.