# A Prospective Cohort Study Investigating the Safety and Efficacy of Tibial Tubercle Osteotomy Using a Novel Multi-Directional Tibial Tubercle Transfer ($MD3T^{TM}$) System

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# Disclosures

Dr. Sherman's disclosures can be found at the AAOS Disclosure site: https://disclosuresearch.aaos.org/search?_ga=2.104669317.42261289.1742422389-1435715100.1728420275.

The remaining authors have nothing to disclose.

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# Background

- Tibial tubercle osteotomy (TTO) is a valuable tool for addressing pathological compressive forces, malalignment, chondral defects, arthritis, and instability in the patellofemoral joint.
- Yields consistent clinical outcomes.
- Demanding procedure with a steep learning curve.
- Novel advances in surgery provides the opportunity to improve precision, modularity, reproducibility, and efficiency, while decreasing complication rates.

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# Objective

- **Purpose:** To evaluate the early safety and efficacy of TTOs performed with the novel $MD3T^{TM}$ surgical system.

- **Hypothesis:** Use of this novel system will result in safe and effective single and multiplane alignment correction in this challenging patient population.

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# Methods

- Duration: October 2019 to August 2022.
- 42 TTO procedures performed using $MD3T^{TM}$ system.
- Electronic medical records were reviewed for:
  - Demographic data
  - Osteotomy type
  - Intra-operative findings
  - Concomitant procedures
  - Complications

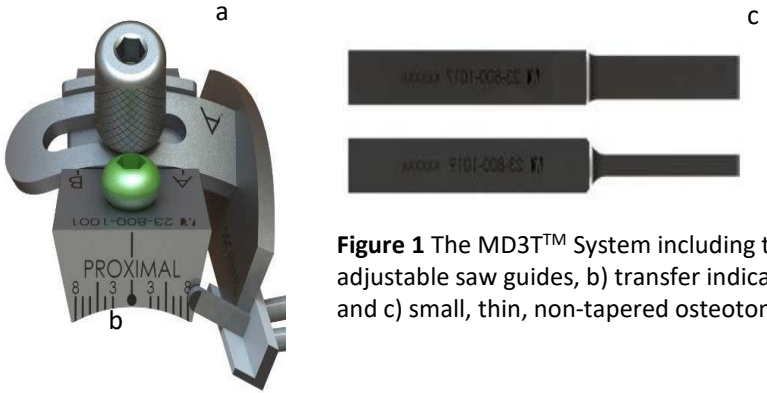


**Figure 1** The MD3T™ System including the a) adjustable saw guides, b) transfer indicator, and c) small, thin, non-tapered osteotomes[3]

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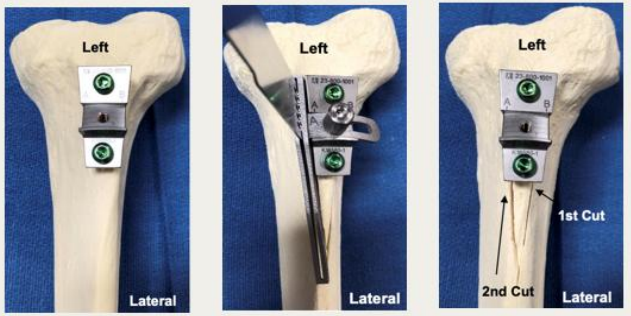
# Methods

- <2 years follow-up excluded.

- Collected patient-reported outcome measures (PROMs) were analyzed using Wilcoxon Signed-Rank and Mann-Whitney tests, respectively.

**Figure 2** (Below, from left to right) MD3T™ System primary guide placement, 2nd (medial) cut setup with outrigger, and primary wedge[4].



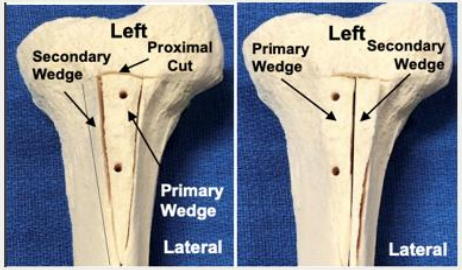




**Figure 3** (Above) primary and secondary wedges freed and transposed[4].

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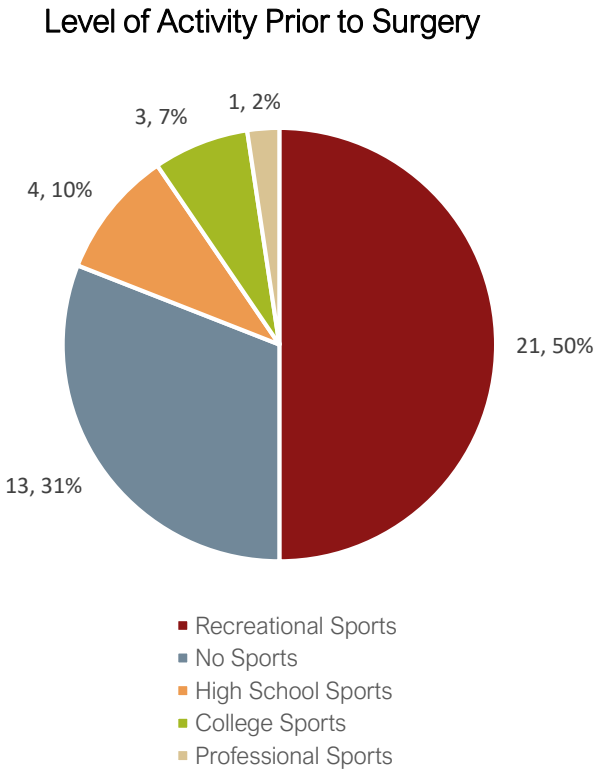
# Results

| Category | Data |
|---|---|
| Number of Knees (Patients) | 42 knees in 39 patients |
| Average Age at Surgery | 29 years (Range: 16 - 69 years) |
| Follow-Up Time | Minimum: 2 years, Mean: 39 months |
| Failed Prior Surgery | 32 patients (76%) |

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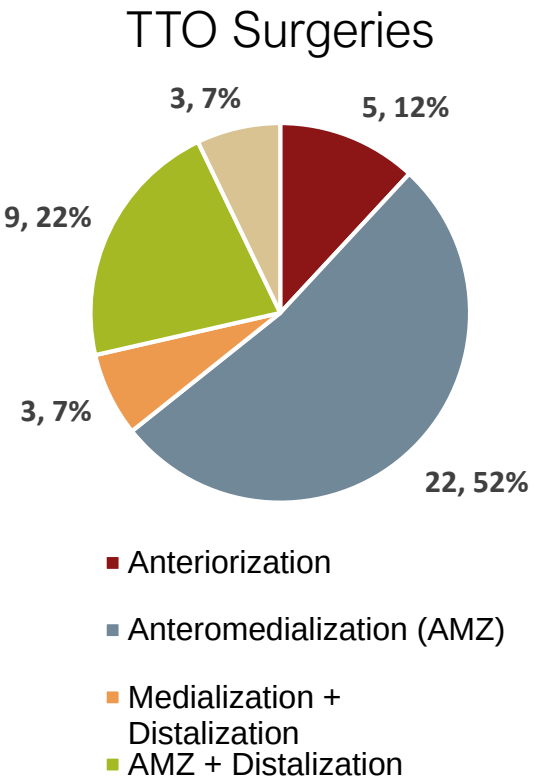
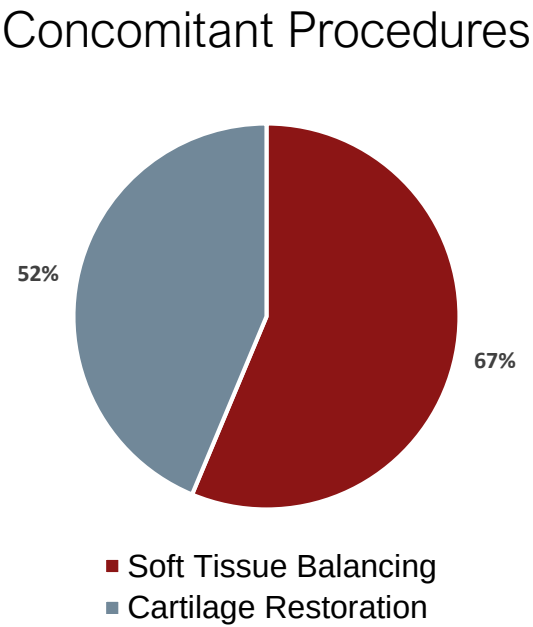
# Results

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# Results

- Statistically significant **( p < 0.05)** improvements in:

  → Knee SANE
  → KOOS Symptom
  → KOOS Sport and Recreation
  → KOOS QOL

| Adverse Outcomes | Overall (n=42) | |
|---|---|---|
| | **N** | **%** |
| Hardware Removal | 1 | 2% |
| Infection | 5 | 12% |
| Stiffness | 1 | 2% |
| DVT | 0 | 0% |
| Revision | 0 | 0% |
| Re-operation | 0 | 0% |
| Malunion | 0 | 0% |
| Non-union | 0 | 0% |
| Intra-op Fracture | 0 | 0% |
| Any Adverse Outcome | 6 | 14% |
| Number of Adverse Outcomes | | |
| **0** | **36** | **86%** |
| 1 | 5 | 12% |
| 3 | 1 | 2% |

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# Conclusion

- Using a novel system demonstrated subjective and objective patient improvement.
- Excellent safety profile with a low incidence of complication at minimum two-year follow-up.
- $MD3T^{TM}$ offers the advantages of independent correction in osteotomy plane, providing enhanced modularity, precision, and reproducibility compared to traditional techniques.

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# Limitations

- Single center
- Single surgeon

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# References


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# Thank you ☺

**Questions?**

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