Longitudinal Outcomes After Dome High Tibial Osteotomy: 1-20 Years Follow-up

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Disclosure

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Introduction

• The clinical success of high tibial osteotomy (HTO) is believed to be due to the correction of the pre-existing angular deformity, shifting the excessive weight-bearing load from the diseased compartment.

• Studies have confirmed the effectiveness of HTO for the relief of pain in knees with unicompartmental osteoarthritis of the knee.

• Additionally, HTO has gained new indications with current techniques available for articular cartilage resurfacing and repairing or replacing the medial meniscus.

• The objectives of this study are to report outcomes data and survivorship of the dome HTO with follow-up from 1-20 years.
Methods

• An IRB approved retrospective review of data was performed for patients who underwent dome HTO from a single surgeon between April 1983 and June 2003.

• Patients were included who underwent a dome HTO for varus alignment and had >1 year follow-up data.

• A modified HSS knee score was analyzed with average latest outcome score with standard deviations reported.

• A Kaplan-Meier survivorship was performed for both outcomes score threshold and for conversion to total knee arthroplasty (TKA).

• Radiographic measurements were obtained.
Results

• 147 knees (134 patients) were included in the study.
• 95 (69%) males and 42 (31%) females.
• 75 (51%) right knees and 72 (49%) left knees.
• Mean length of follow-up was 9 +/- 5 years (Range = 1-20 years).
• Mean age at the time of surgery was 56 +/- 9 years (Range = 28-75 years) and at the latest follow-up was 66 +/- 9 years (Range = 44-85 years).
Results: Outcome Measure

• Average modified HSS knee score improved from 62.0 pre-operatively to 85.7 post-operatively.

• Kaplan-Meier curve of the total 147 knees in the study, for a modified HSS knee score >85 as endpoint showed survival rate was 70% at 5 years, 56% at 10 years, 47% at 15 years, 37% at 17 years.

• The average survival time was 12 years
Results: Outcome Measure

Figure 1: Survivorship (PGS score ≥ 85) for Overall Study (n=147 Knees)
Results: Survivorship

- 67 knees reached endpoint >85 on the modified HSS knee score during the study.
- Kaplan-Meier curve of 150 knees for TKA survivorship showed a survival rate of 93% at 5 years, 76% at 10 years, 63% at 15 years, 44% at 19 years.
  - 147 knees in the study + 3 knees with TKA data but not in overall analyses
- The average survival time was 16 years.
Results: Survivorship

Figure 2: Survivorship (No TKR) for Overall Study (n=150 Knees)
Results: Mechanics

• Analyzing the 147 knees in the study, mechanical axis deviation (MAD) as measured by a percent hemi-tibia versus femoral tibial angle (FTA) is a linear relationship.

• A scatter plot shows excellent correlation between MAD by FTA for each pair that was available.

• There were a total of 619 MAD/FTA x-ray pairs, where a pair is from the same x-ray exam date.
Results: Mechanics

Figure 3: Relationship Between Mechanical Axis Deviation (% Hemitibia) to Femoral-Tibial Angle for Overall Study (n=147 Knees)
Complications

- Complications reported:
  - 24 infections (16%)
  - 6 patients with peroneal neuropraxia (4%),
  - 5 delayed unions (3%)
  - 4 non-unions (3%)
  - 4 patients with over-correction (3%)
  - 2 patients with phlebitis (1%).
Conclusions

• This retrospect review of 147 dome HTO patients with 1-20 year follow-up shows that outcomes scores significantly improved at final follow-up compared to pre-operative scores.

• The survivorship of outcomes >85 points on the modified HSS knee score after dome HTO averaged 12 years with 67 knees (46%) maintaining this outcome score at final follow-up.

• The survivorship of knees undergoing dome HTO with an endpoint of TKA averaged 16 years with 44% avoiding arthroplasty at 19 years.

• Radiographic analysis shows that MAD and FTA have a linear relationship and can be used interchangeably to determine correction.