

PROSPECTIVE CLINICAL STUDY · 2015–2021

Subtalar, Double, and Triple Arthrodesis with Cannulated Compression Screws

A Prospective Evaluation of the Medartis APTUS® SpeedTip® CCS System



Naji S. Madi, MD · **Edwin Chaharbakshi, MD** · John Pisquiy, MD · Mark E. Easley, MD

Department of Orthopaedic Surgery, West Virginia University | Duke University Medical Center

PRESENTED BY EDWIN CHAHARBAKHSI, MD

DISCLOSURES

Financial Disclosures

The presenter has
no financial disclosures
relevant to this presentation.

STUDY FUNDING

Investigator-initiated study with implant and financial support from Medartis. The sponsor had no role in data collection, analysis, or manuscript preparation.

BACKGROUND

The Clinical Problem

Hindfoot arthritis—from progressive collapsing foot deformity, post-traumatic degeneration, or inflammatory arthropathy—remains a source of disabling pain and rigid deformity when nonoperative care fails.

Subtalar, double, and triple arthrodesis reliably correct deformity and relieve pain—but nonunion, malunion, and hardware-related complications persist across the literature.

THE GAP

Most outcomes data are retrospective. Implant-specific performance of modern cannulated compression screw systems has not been rigorously prospectively evaluated.

REPORTED NONUNION RATES — HINDFOOT ARTHRODESIS

Subtalar (isolated)

0 – 9%

Saragaglia, Jennison

Double arthrodesis

0 – 12%

Ferreira, Fadle

Triple arthrodesis

5 – 30%

Klassen, Pell

STUDY OBJECTIVE

Prospectively assess fusion rates and clinical outcomes with the Medartis APTUS® SpeedTip® 5.0 / 7.0 CCS system.

Study Design & Protocol

HYPOTHESIS

Medartis APTUS® SpeedTip® CCS will achieve fusion rates and clinical outcomes comparable or superior to those reported for standard hindfoot arthrodesis.

DESIGN

- Prospective, single-institution, industry-supported investigator-initiated trial
- Enrollment: 2015–2021 (IRB approved 10/2015, renewed 9/2020)
- n = 50 enrolled | 41 underwent index procedure | 24 completed ≥2-yr follow-up

INCLUSION

- Age 18–75 undergoing subtalar, double, or triple arthrodesis
- Indications: hindfoot OA, post-traumatic arthritis, rigid PCFD, inflammatory arthropathy, tarsal coalition

OUTCOMES ASSESSED

- Radiographic union — WB foot, ankle mortise, Saltzman hindfoot views
- CT at 6 mo to confirm fusion; repeat at 12 & 24 mo if nonunion suspected
- PROMs: VAS-Pain, Modified Coughlin, AOFAS Hindfoot, FADI

FOLLOW-UP & STATISTICS

- Visits at 6 wk, 3 mo, 6 mo, 1 yr, and 2 yr postoperatively
- χ^2 , ANOVA, t-tests, Wilcoxon rank-sum; logistic regression for binary outcomes ($\alpha = 0.05$)

Fusion Rates & Cohort

90.2%

COMPLETE OSSEOUS FUSION

37 of 41 cases

7.3%

NONUNION RATE

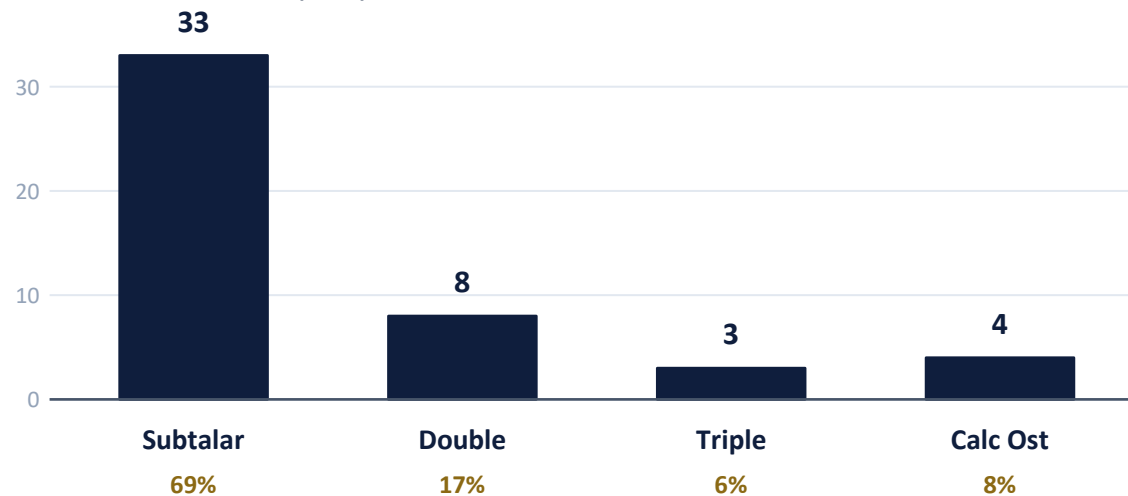
3 of 41 cases

0%

MALUNION

no malalignments

PROCEDURE DISTRIBUTION (n=48)



PRIMARY INDICATION (n=50)

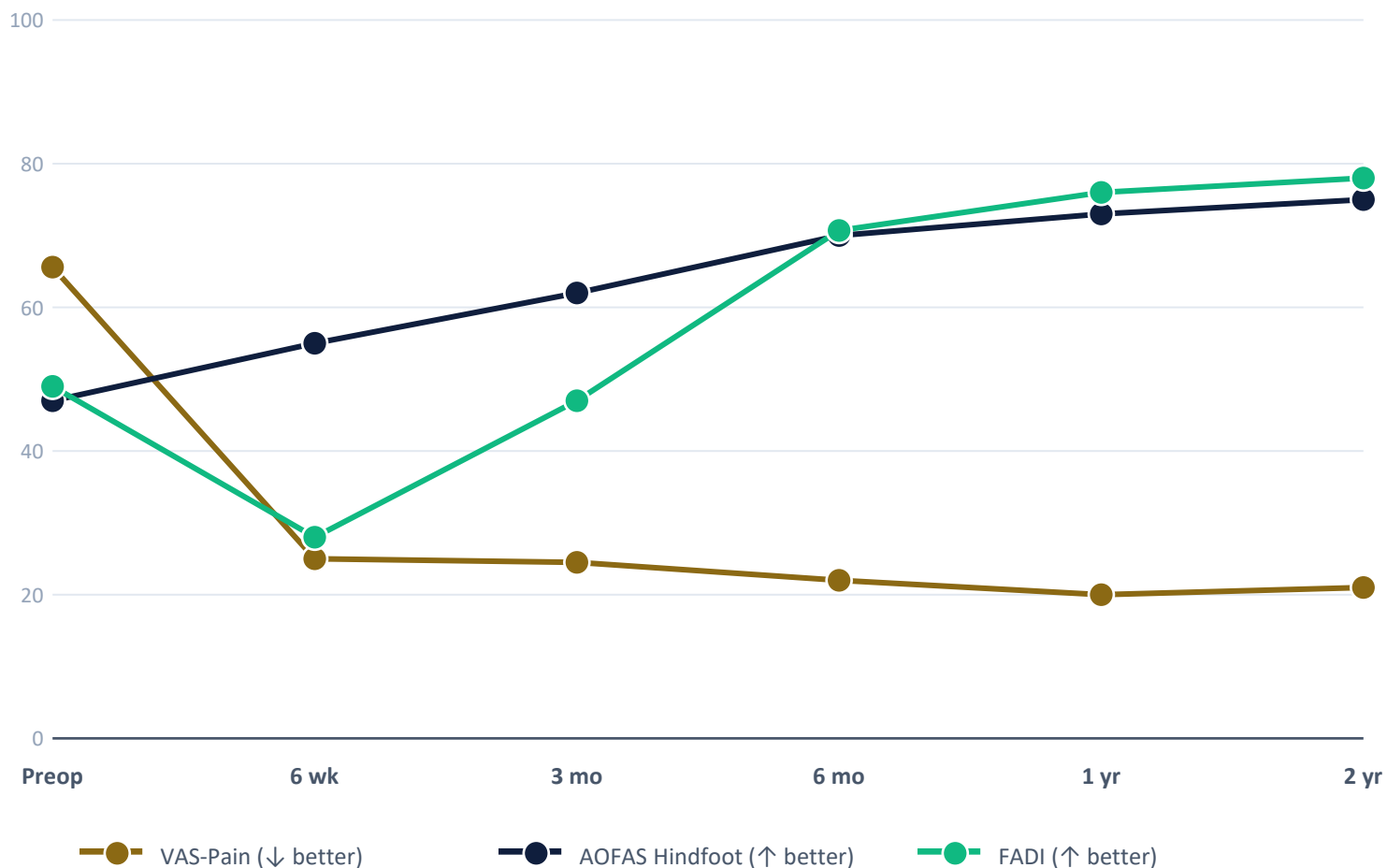
Osteoarthritis	22	44%
Other	17	34%
Post-traumatic arthritis	8	16%
Rheumatoid arthritis	3	6%

Cohort weighted toward isolated subtalar fusion — see Conclusions / limitations.

Subtalar, Double & Triple Arthrodesis with APTUS® SpeedTip® CCS

Chaharbakhshi E, et al.

Patient-Reported Outcomes Over Time



VAS-PAIN

65.6 → 25

p < 0.0001

significant at 6 wk — sustained through 2 yr

AOFAS HINDFOOT

47 → 62

p < 0.05

significant at 3 mo — plateau to 75 at 2 yr

FADI

49 → 71

p < 0.05

significant at 6 mo — transient early dip

ANOVA, paired t-tests, and Wilcoxon rank-sum used for within-subject comparisons vs. preoperative baseline ($\alpha = 0.05$).

Complication Profile

MAJOR COMPLICATION RATE

12.2%

driven by symptomatic hardware removal (5/41)

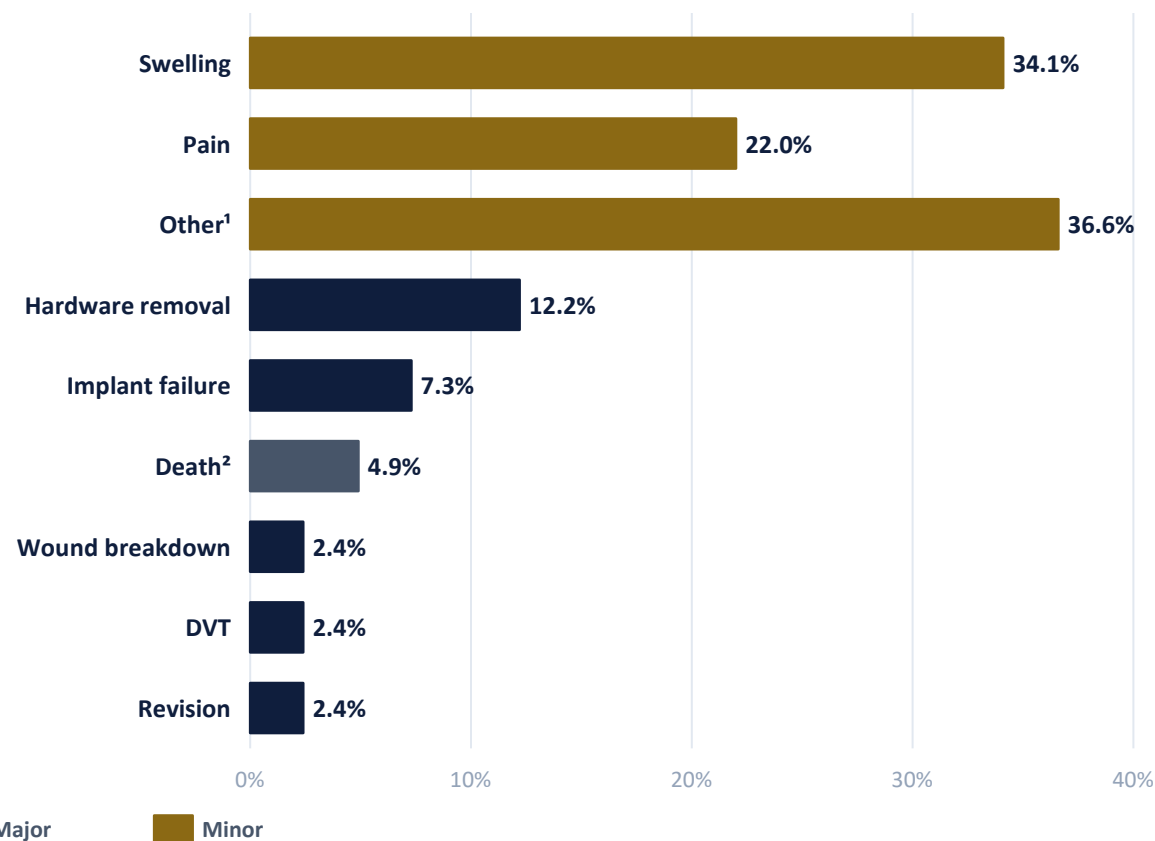
MAJOR EVENTS BREAKDOWN

- Hardware removal **12.2% (5)**
- Implant failure (screw breakage) **7.3% (3)**
- Revision arthrodesis **2.4% (1)**

NOTABLY ABSENT

- deep infections
- pulmonary emboli
- malunions
- amputations

ALL COMPLICATIONS (% of 41 operated cases)



¹ Persistent residual heel discomfort, lateral column pain, peroneal sequelae. ² Both deaths unrelated to the procedure.

CONCLUSIONS

Medartis APTUS® SpeedTip® CCS delivered **reliable fusion, rapid pain relief, and durable functional gains** for hindfoot arthrodesis.

FUSION

90.2%

no malunions | nonunion 7.3% within published range

PAIN

VAS 66 → 25

significant at 6 wk | sustained to 2 yr ($p < 0.0001$)

FUNCTION

AOFAS +28 pts

FADI improved from 49 → 78 | most gain in first 6 mo

LIMITATIONS

Single-center cohort · 48% attrition at 2 yr · subtalar-predominant (33/48) · no comparator arm

CLINICAL TAKEAWAY

Prospective data support the APTUS® SpeedTip® CCS as a reliable fixation option for subtalar and tarsal fusion—yielding a pain-free, stable, weight-bearing foot.

Thank you · Questions?