Total arthroplasty of the metatarsophalangeal joint of the hallux
an average 4 years prospective follow-up study

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Our disclosure is in the final AOFAS Mobile App.
We have no potential conflicts with this presentation.
Background: Hallux rigidus

Arthrodesis: gold standard

But permanent loss of motion
  • precludes normal gait mechanics
  • may accelerate degeneration of adjacent joints
  • some patients hesitant to accept arthrodesis

MTP I prosthesis

  • Several attempts for MTP I prosthesis
  • In theory: normal gait pattern
  • In reality: unacceptable high rate of complications

Esway, Foot Ankle Clin, 2005
Fuhrmann R et al. Foot Ankle Clin. 2003
Aim & Hypothesis

Aim
To evaluate the mid-term results of a new three-component, cementless MTP I prosthesis design

Hypothesis
a) good pain relief and function
b) good MTP-I mobility
c) stable primary fixation and osteointegration & good radiological alignment
Methods

Anatomically designed three-component cementless MTP I prosthesis:
  • METIS (Newdeal SA, Integra Life Science ILS, New Jersey, USA)

Cohort
  • Prospective study of consecutive patients
  • 2008 - 2010: n=29 (10 m, 15 f, 4 bilateral cases)
  • Age: 63 years (48-87)
  • Average follow-up: 49.8 months (36-62)

Clinical & functional data
  • AOFAS forefoot score (0-100), VAS pain (0-10), range of motion

Radiological data
  • Alignment / angles, loosening, adjacent joint degeneration
Clinical Results

No patient lost to follow-up
  • 2 patients (3 cases) died
  • 4 cases (13.8%) salvage arthrodesis

7 revision surgeries (components left in place)
  • painful arthrofibrosis n=5, malalignment/luxation n=2

AOFAS Forefoot Score: 54.8 (0-80) → 83.5 (58-95, p<0.001)

VAS pain: 5.9 (5-9) → 1.2 (0-5, p<0.001)

Function:
  • 16 (72.7%) fashionable shoes
  • Sports: 4 patients (13.8%) → 13 patients (56.5%)

Satisfaction: 15 (68.2%) fully satisfied 7 (31.8%) satisfied with reservations
Range of Motion

Poor results:

- 11 cases (50.0%): dorsiflexion contracture
Results: X-ray

No migration of components
No revision for loosening
Radiolucent lines: no correlation to clinics

- Zone 1: 1 case (4.5%)
- Zone 2: 16 cases (72.7%)
- Zone 3: 2 cases (9.1%)

8 cases (36.4%): progression of IP arthrosis
Alignment
Pain & function

Good clinical mid-term results with respect to

- AOFAS forefoot score
- Pain reduction
- Daily live activities as well as sports activities
Range of motion & x-ray

Disappointing ROM
  • in line with other studies

Adjacent joint degeneration

No migration/ no revision for loosening
  • Significance of radiolucent lines?
  • Superior to other designs

Alignment /stability:
  • Ligament balancing and osseous alignment?
  • Edge loading, wear and longevity?
  • Angles did not correlate with pain & AOFAS

Lange et al., 2008; Brewster et al., 2010
Sinhah et al., 2010
Take Home Message

Good clinical mid-term results

Less loosening compared to other types

Poor range of motion

Technically demanding procedure
  • Ligament balancing and stability is a problem
  • higher risk for revision surgery and complications

Second line treatment for select situations
Thank You!

References (selection):