

Supramalleolar Osteotomy: a joint – preserving option for advanced osteoarthritis

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Osteoarthritis of ankle

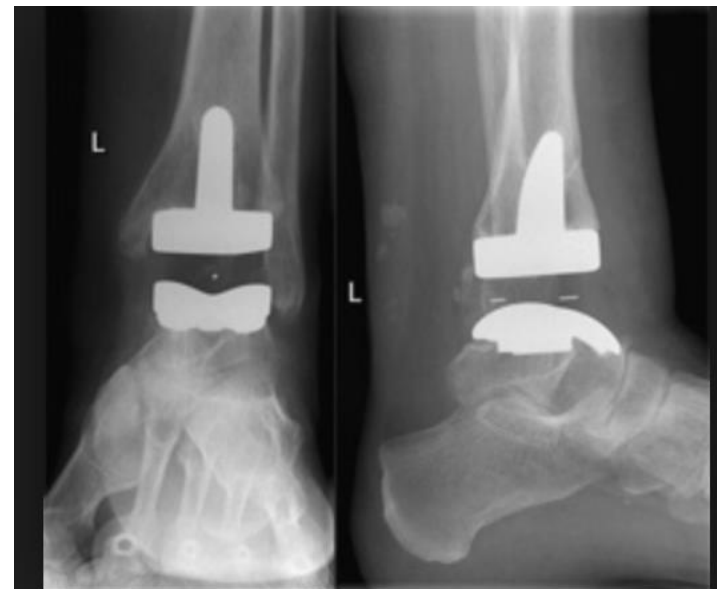


Surgical Options

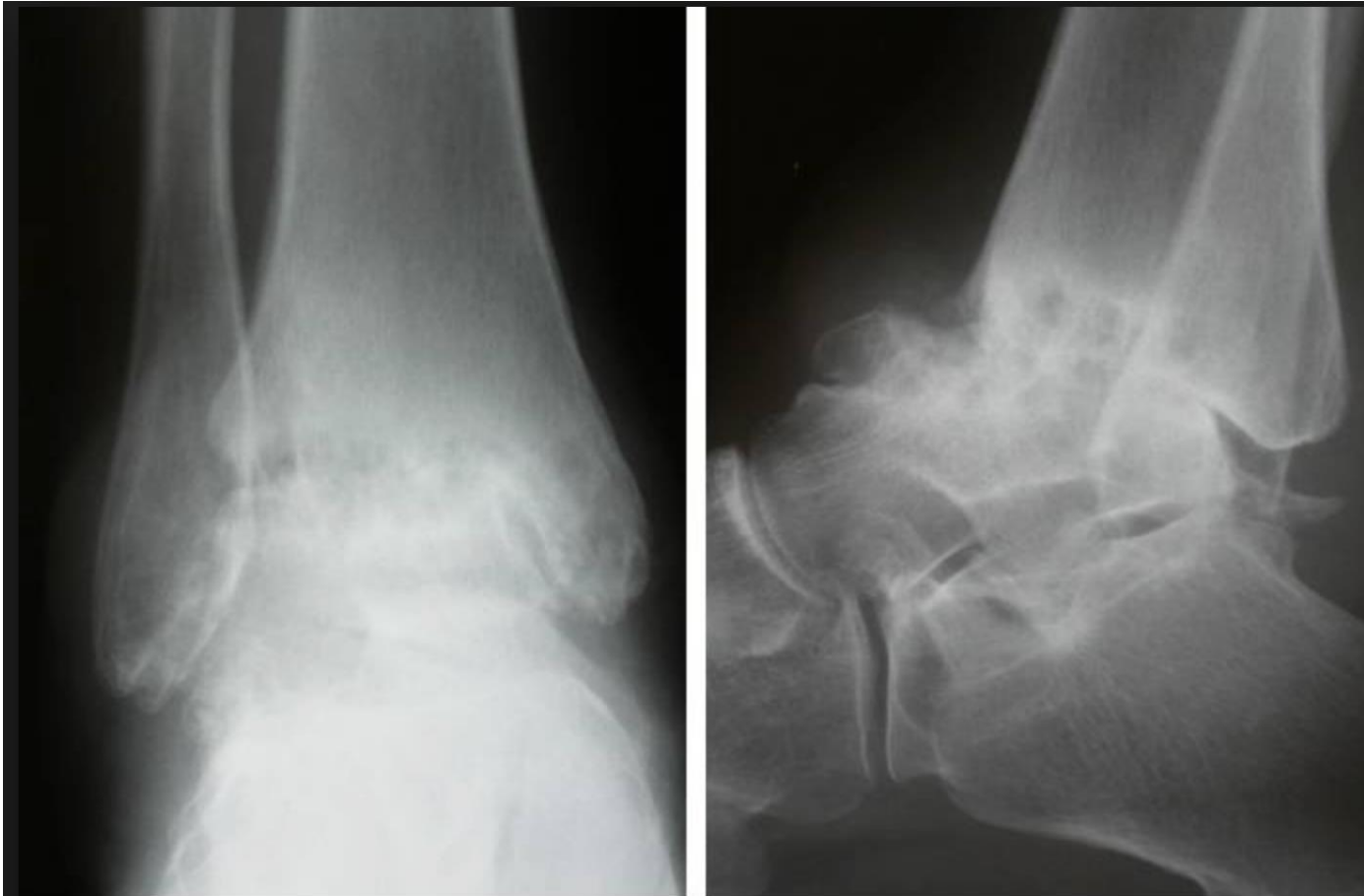
- Ankle fusion



- Ankle Replacement

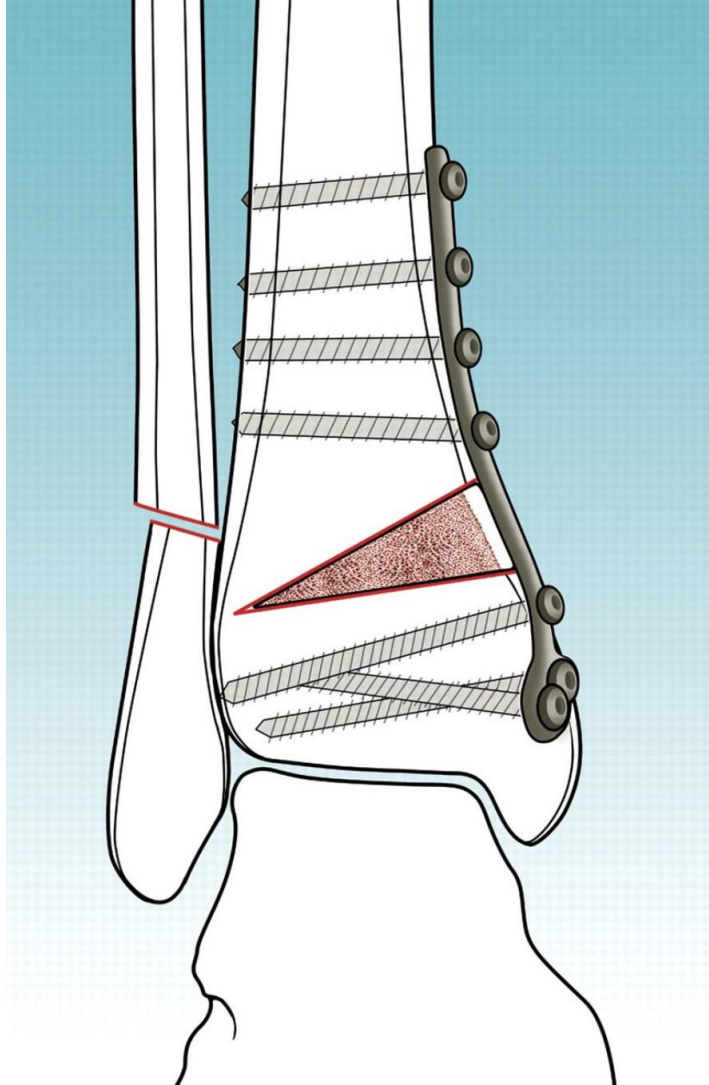


Advanced OA



Single compartment involvement with malalignment?





Advantages of Osteotomy

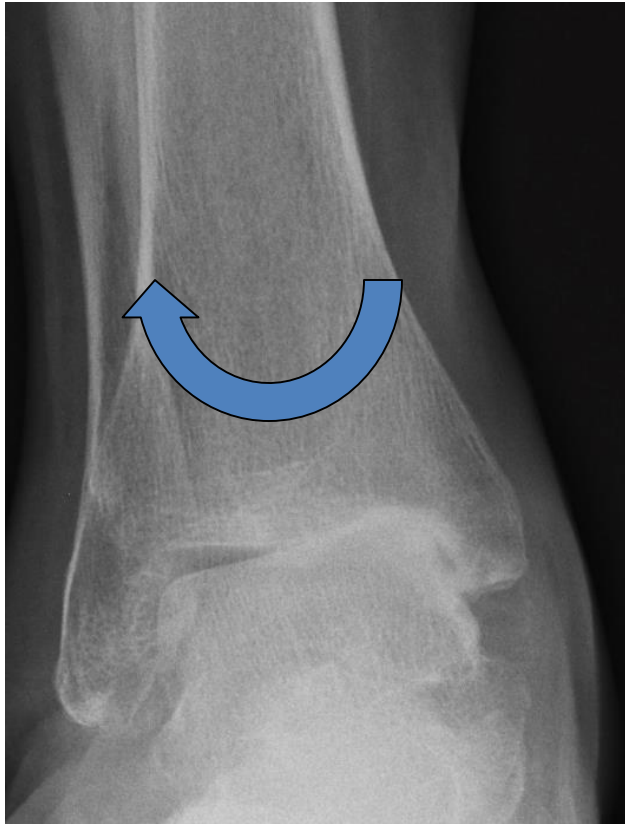
- Joint preserving(Buys time)
- Motion preserving
- Redistributes forces, offloading the damaged area
- Corrects malalignment, making future surgery less demanding
- Good patient satisfaction

How does it work?

- Aims to achieve correction of deformity in **coronal plane**(varus or valgus angle)



How does it work?



How does it work?

Addresses **tibiotalar malalignment**

Cadaveric biomechanical studies have shown decrease of the contact surface area of the ankle joint up to **40 %** in presence of malalignment

Tarr RR, Resnick CT, Wagner KS, et al. Changes in tibiotalar joint contact areas following experimentally induced tibial angular deformities. Clin Orthop Relat Res 1985;199:72–80.

Untreated ligamentous instability



Our series:

- Retrospective study from 2008 onwards
- 33 patients over 7 year period
- 21 varus and 12 valgus ankles
- Average age: 57 years
- Single surgeon series

Inclusion criteria

- Symptomatic ankle OA
- Varus or valgus ankle deformity on X Ray with single compartment OA
- Failure of conservative line of treatment

Exclusion criteria

- Associated **sub-talar** arthritis
- **Concentric** arthritis of ankle
- **Inflammatory** arthritis
- **Neuropathic** disorder
- **Vascular** insufficiency

History and Clinical examination

- Single compartment arthritis
- Failed conservative treatment
- Patient refusing for fusion and not suitable for ankle replacement due to deformity
- Good soft tissues
- No neurovascular compromise
- Check ankle ROM
- Alignment

Preop planning-AOFAS scores

Ankle-Hindfoot Scale (100 Points Total)

Pain (40 points)	
None	40
Mild, occasional	30
Moderate, daily	20
Severe, almost always present	0
Function (50 points)	
<i>Activity limitations, support requirement</i>	
No limitations, no support	10
No limitation of daily activities, limitation of recreational activities, no support	7
Limited daily and recreational activities, cane	4
Severe limitation of daily and recreational activities, walker, crutches, wheelchair, brace	0
<i>Maximum walking distance, blocks</i>	
Greater than 6	5
4-6	4
1-3	2
Less than 1	0
<i>Walking surfaces</i>	
No difficulty on any surface	5
Some difficulty on uneven terrain, stairs, inclines, ladders	3
Severe difficulty on uneven terrain, stairs, inclines, ladders	0
<i>Gait abnormality</i>	
None, slight	8
Obvious	4
Marked	0
<i>Sagittal motion (flexion plus extension)</i>	
Normal or mild restriction (30° or more)	8
Moderate restriction (15°-29°)	4
Severe restriction (less than 15°)	0
<i>Hindfoot motion (inversion plus eversion)</i>	
Normal or mild restriction (75%-100% normal)	6
Moderate restriction (25%-74% normal)	3
Marked restriction (less than 25% normal)	0
<i>Ankle-hindfoot stability (anteroposterior, varus-valgus)</i>	
Stable	8
Definitely unstable	0
Alignment (10 points)	
Good, plantigrade foot, midfoot well aligned	15
Fair, plantigrade foot, some degree of midfoot malalignment observed, no symptoms	8
Poor, nonplantigrade foot, severe malalignment, symptoms	0
Total=	100

Preop planning and Biomechanics





**Tibial Mech
Axis**



**TIBIAL
ARTICULAR
SURFACE**





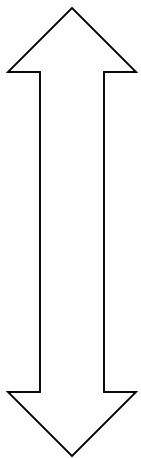
CORA



20 DEGREES



CORA

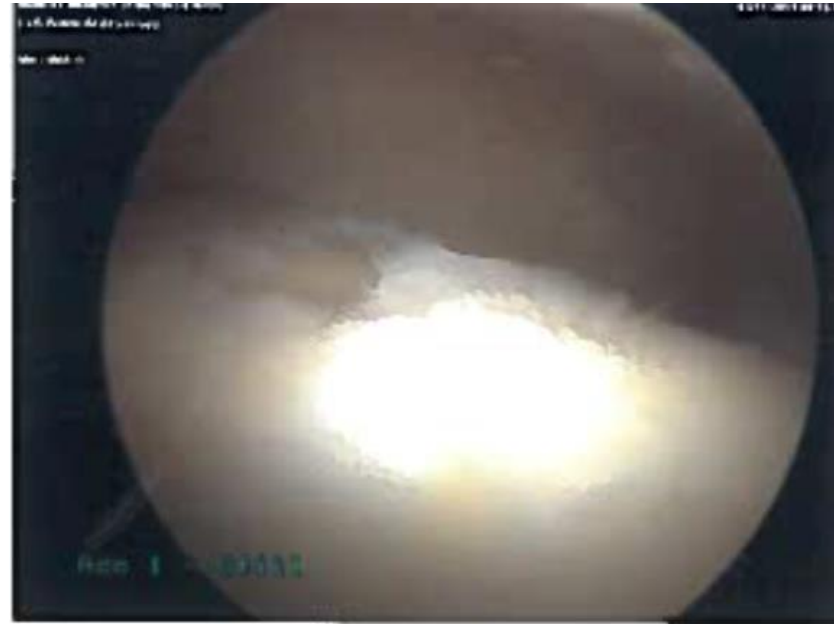


5 CMS

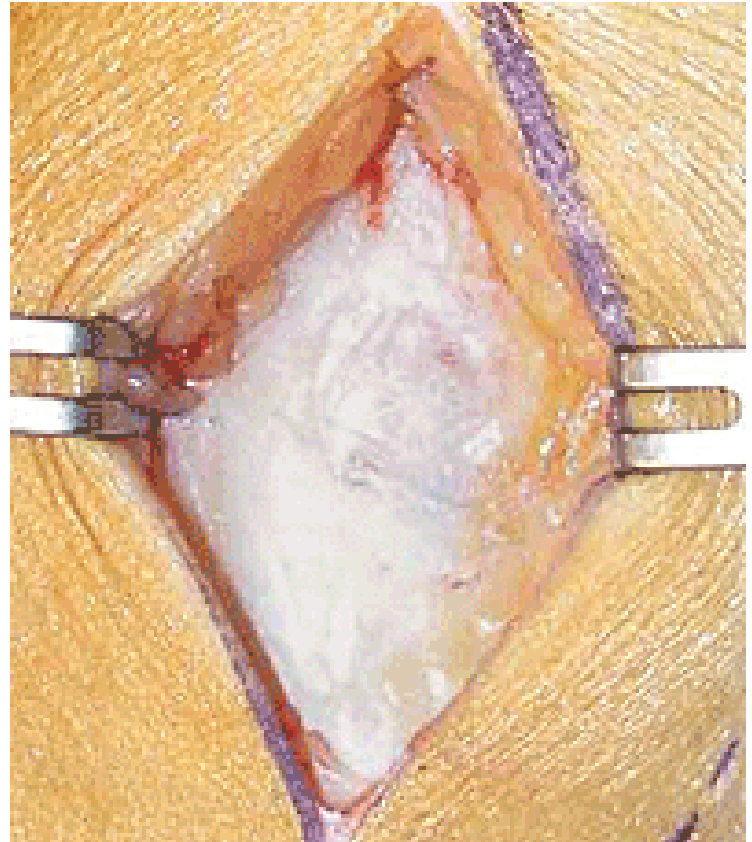
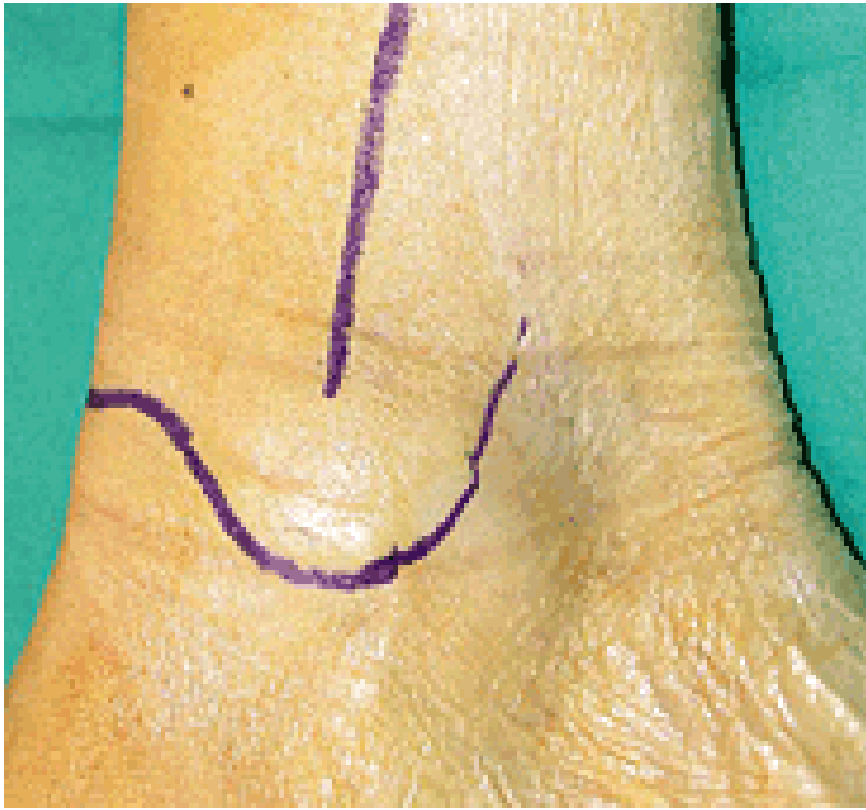
Saltzman view



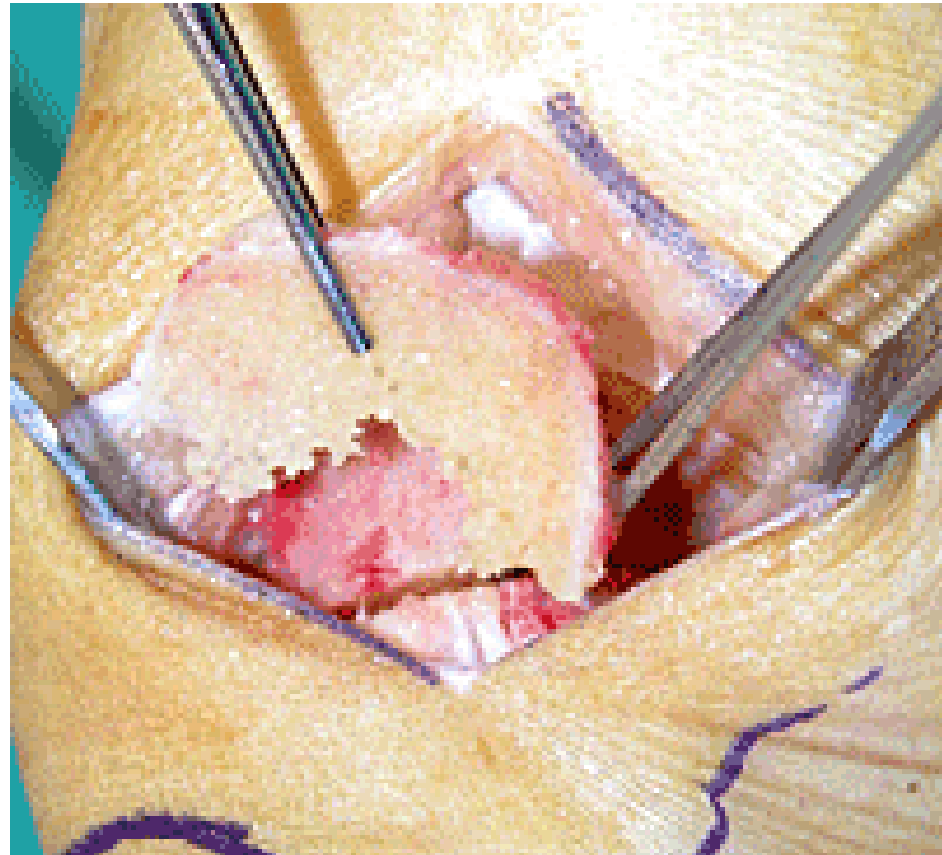
Ankle arthroscopy-confirm one compartment involvement

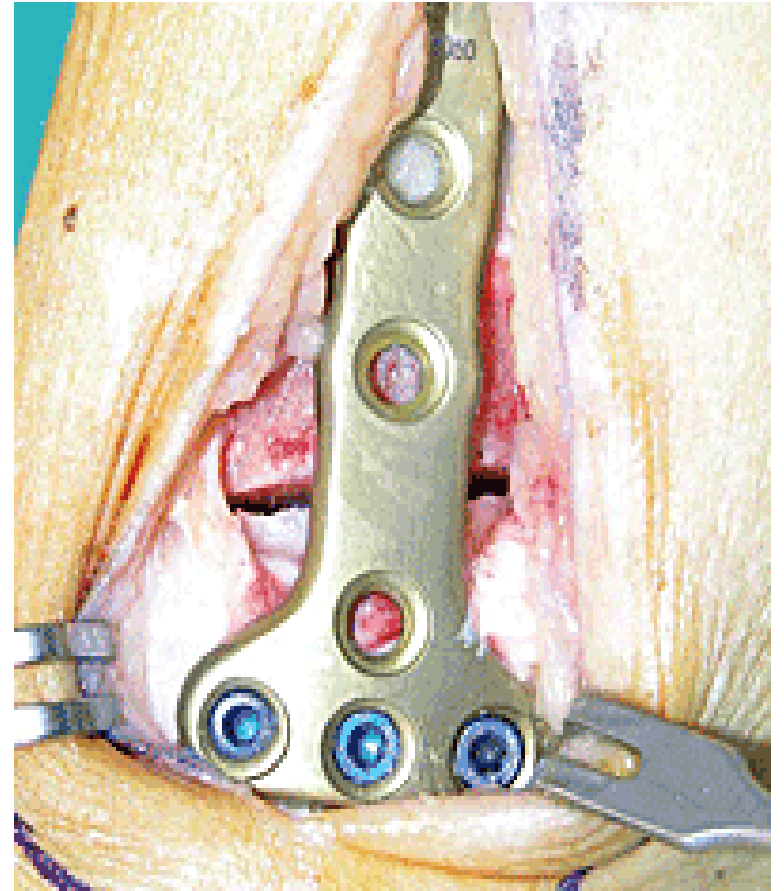










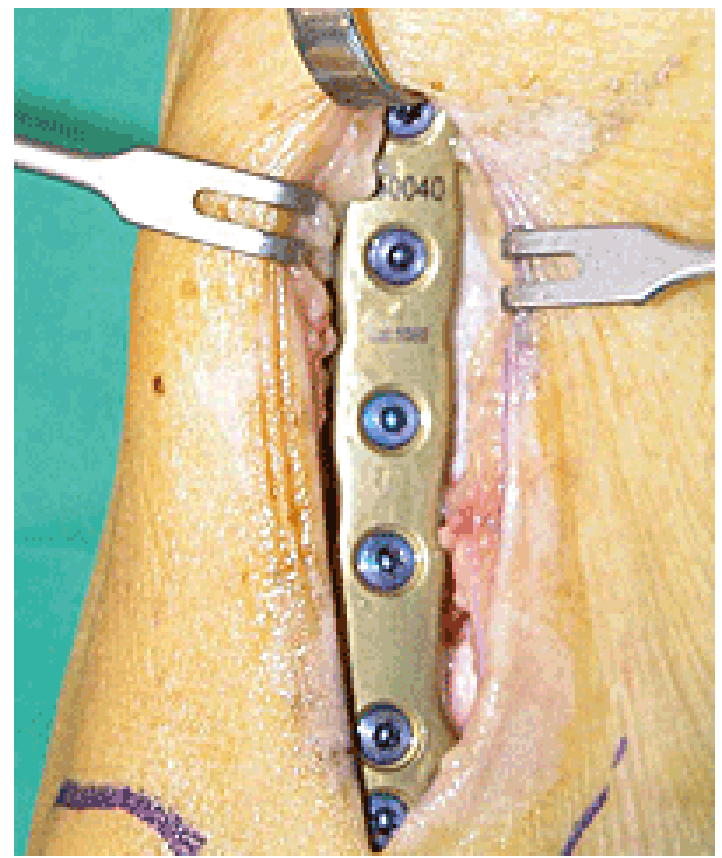




5d



5e





Post op

- NWB 6 weeks B/K POP
- Moon boot and physio 6 weeks
- DVT prophylaxis
- F/U at 3,6,12,18 and 24 months



Lateral closing Wedge-Varus



Medial closing Wedge-Valgus



6 months post op



Literature

*Harstall et al , Foot and ankle International Vol.
28 No 5/May 2007*

9 patients underwent supramalleolar osteotomies

AOFAS scores :pre-op 48

:post-op 74

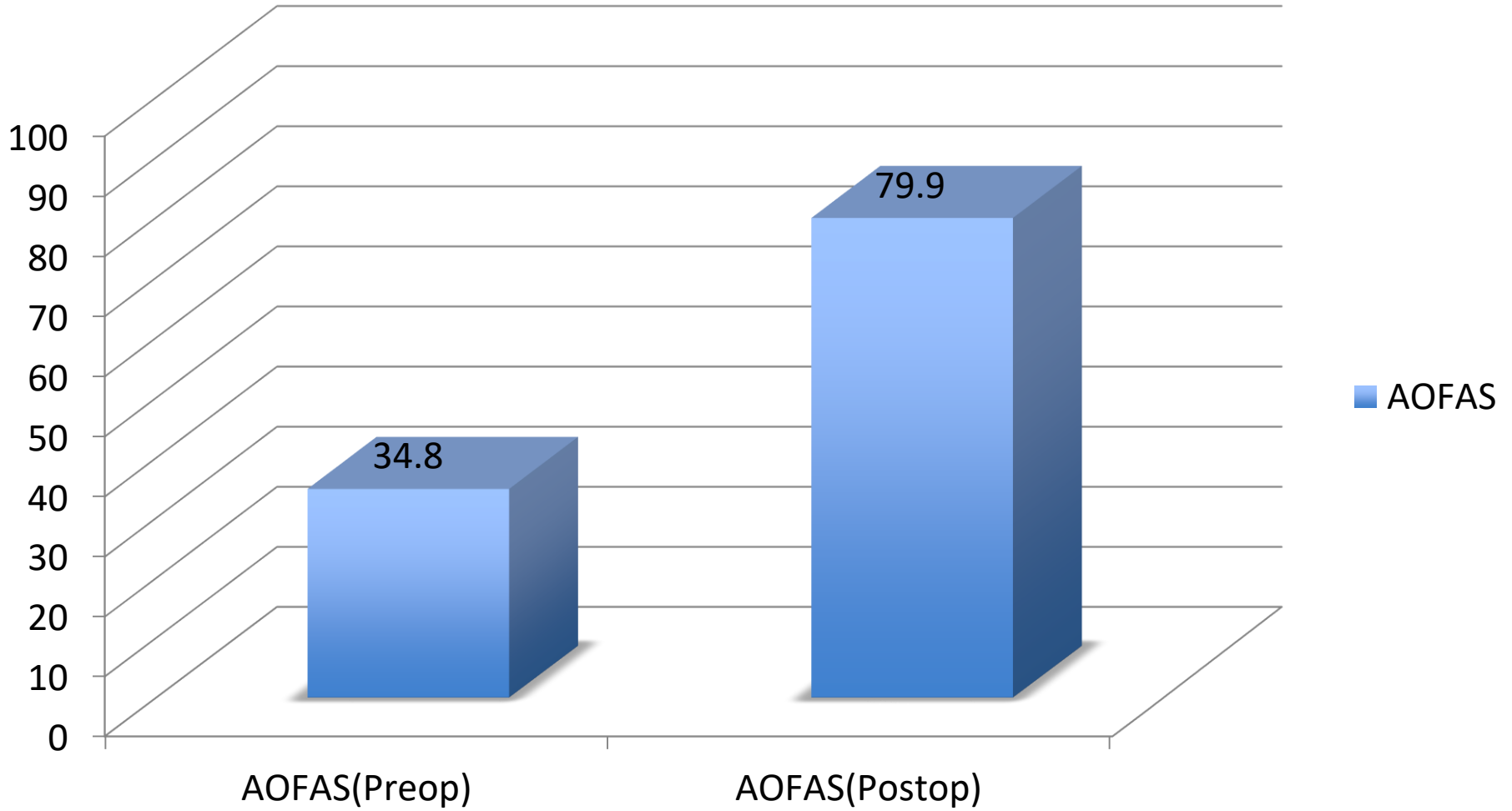
33 patients

- Average follow up 25months (22-30)
- 21 had lateral ligament reconstruction using modified brostrom procedure
- All 33 osteotomies healed with no non-unions, no infections.
- Time to radiological union 8.6 weeks(8-10 weeks)

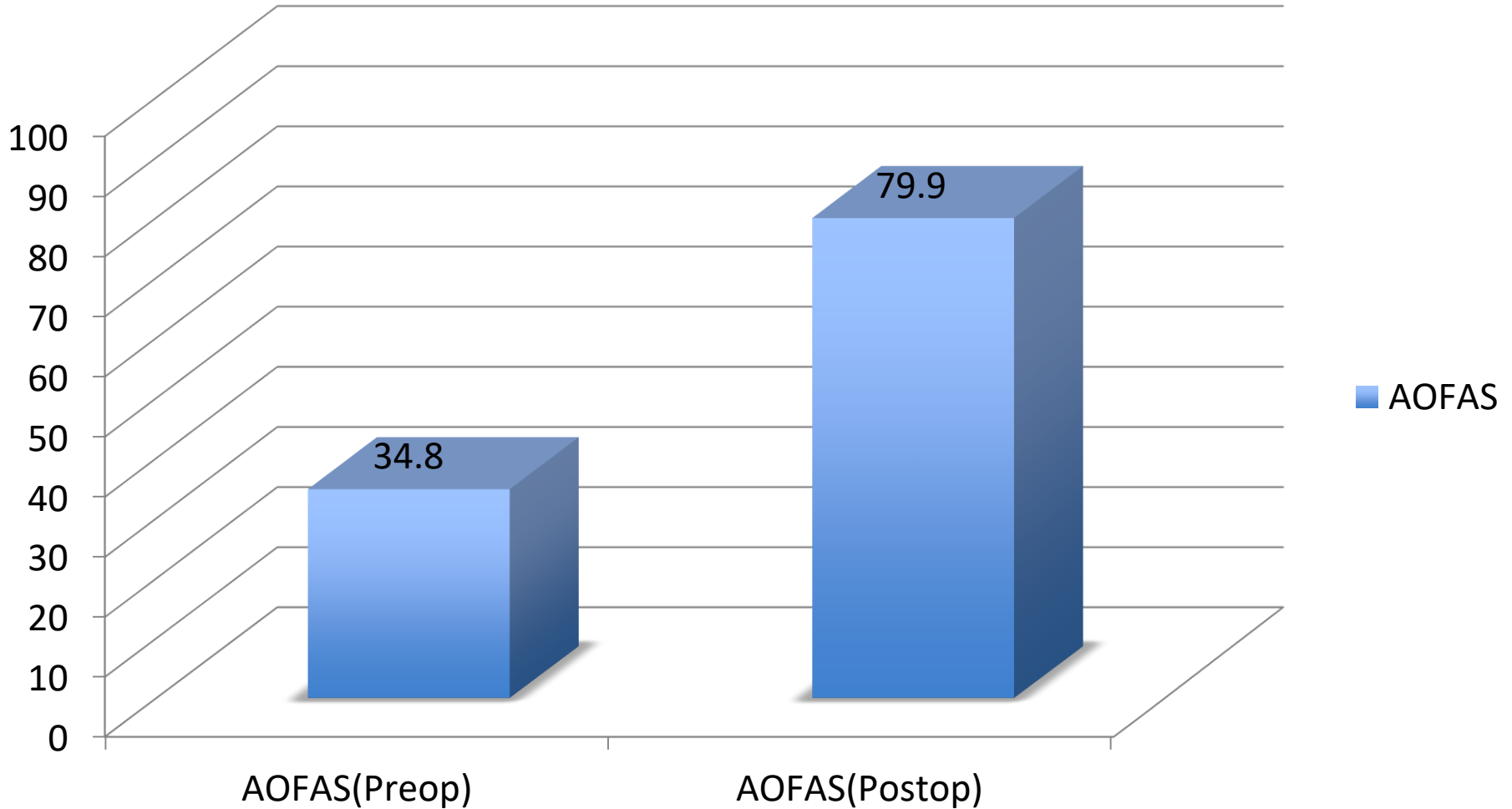
33 patients

- Pre-op AOFAS score 34.8
- Post-op AOFAS score 79.9

AOFAS



Ankle ROM...needs to be added



2 failures

- Three revised to fusion
- One to ankle replacement
- Two patients to fusion using arthroscopic techniques

Summary

- Supramalleolar osteotomy is a viable option for mild/moderate arthritis with deformity
- Patient selection plays an important role
- Preserves motion and corrects malalignment
- Future replacement or fusion are not compromised in event of failure.

Thank you

