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Changes in Foot Pressure among patients with Varus Knee Osteoarthritis Undergoing Bilateral Simultaneous Total Knee Arthroplasty – a Prospective Observational Pedobarographic Assessment

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Disclosures

- Managing Director of Virbhadra Implants Pvt Ltd.
- The above is not having any bearing with this presentation.



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Introduction

- Osteoarthritic varus knee- compensatory hindfoot valgus^{1,2}
- Lateralised foot loading pattern³
- Pain and hindfoot valgus might persist post surgery
- Result- implant failure & dissatisfaction^{2,4}
- Gait analysis- Costly & laborious
- Pedobarography- simple and objective assessment^{3,5}



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Aims and Objectives

- **Aim:**

- Determine the pedobarographic patterns in patients with primary varus osteoarthritis knee undergoing bilateral total knee arthroplasty

- **Objective:**

- Assess the changes in pedobarographic parameters pre-operative and post-operatively in patients undergoing bilateral total knee arthroplasty
- Define foot pressure changes among subgroups of varus knee deformity
- Pre-operative and post-operative assessment of PROMs for ankle function



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Methodology

Inclusion Criteria –

- All patients for simultaneous single staged B/L TKA
- Age 45 – 85
- B/L varus knee deformities (KL grade IV)
- Varus knee with/without ligamentous laxity

Exclusion Criteria –

- Extra-articular knee deformity
- Revision TKA
- OA of ankle joint
- Secondary Arthritis of knee/ankle
- Any previous ligament surgery/reconstruction
- H/o Septic Arthritis knee
- Any neurological disorder affecting gait



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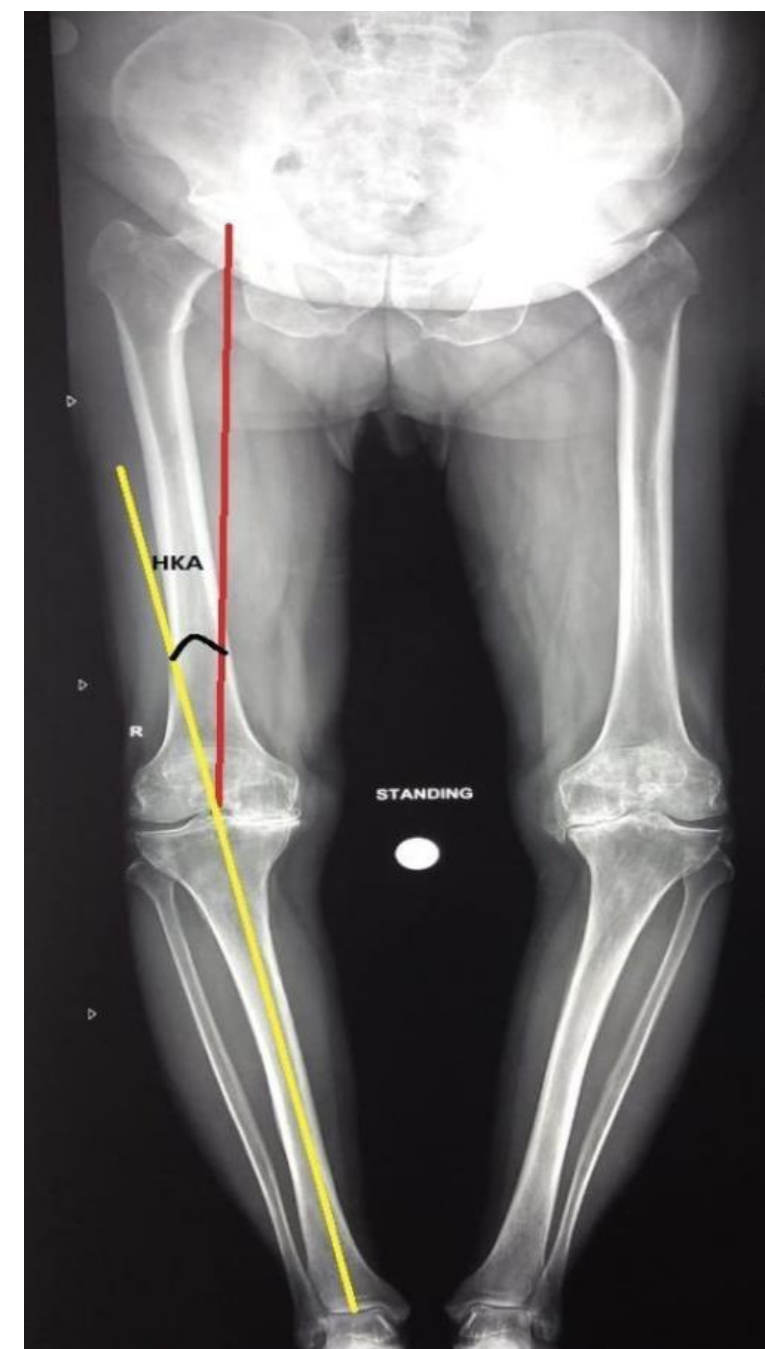
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Methodology



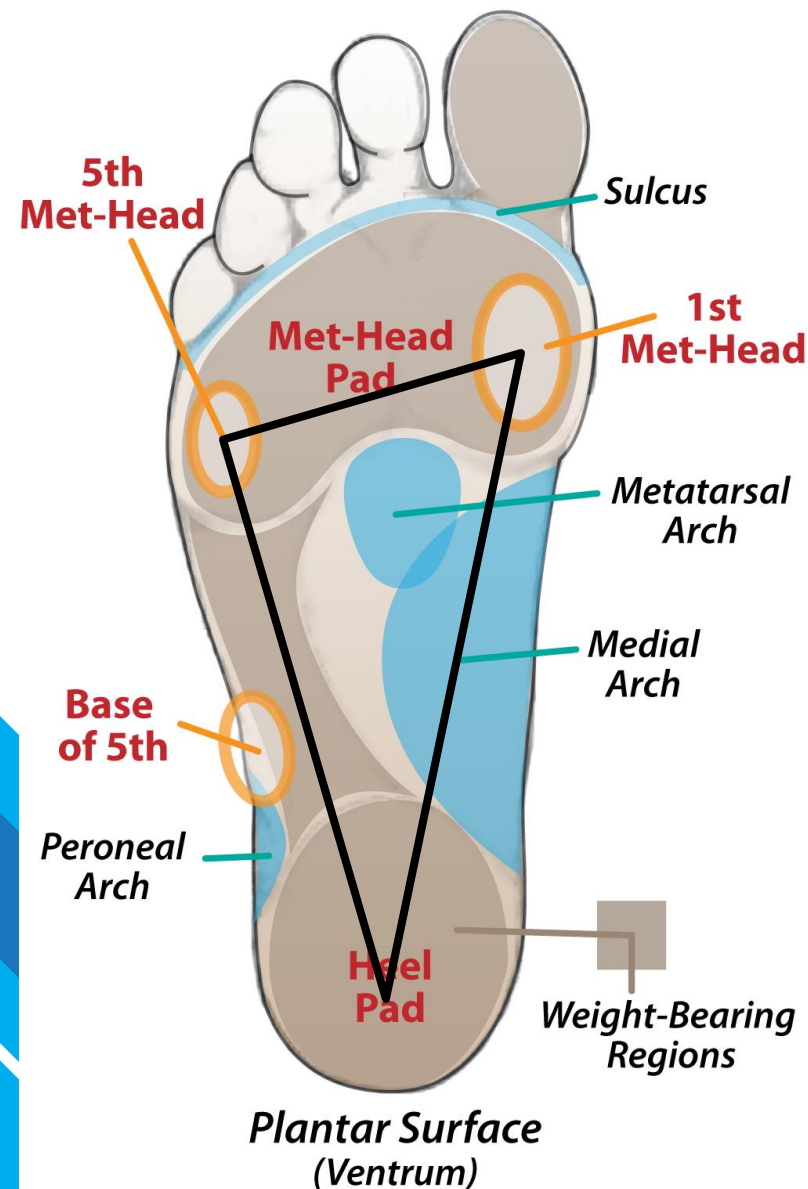
P-walk pedobarography system



Measurement of HKA Angle



Outcome measures



- Pedobarography:
 - Maximum pressure (Pmax) in kPa
 - Head of the 1st metatarsal, Head of the 5th metatarsal and average of lateral and medial heel pressures- Tripod
- Ankle and Foot scores:
 - Foot and ankle ability measure (FAAM) activities of daily living subscale
 - AOFAS ankle hindfoot scale
- Measurements taken at preop and 6 months follow-up



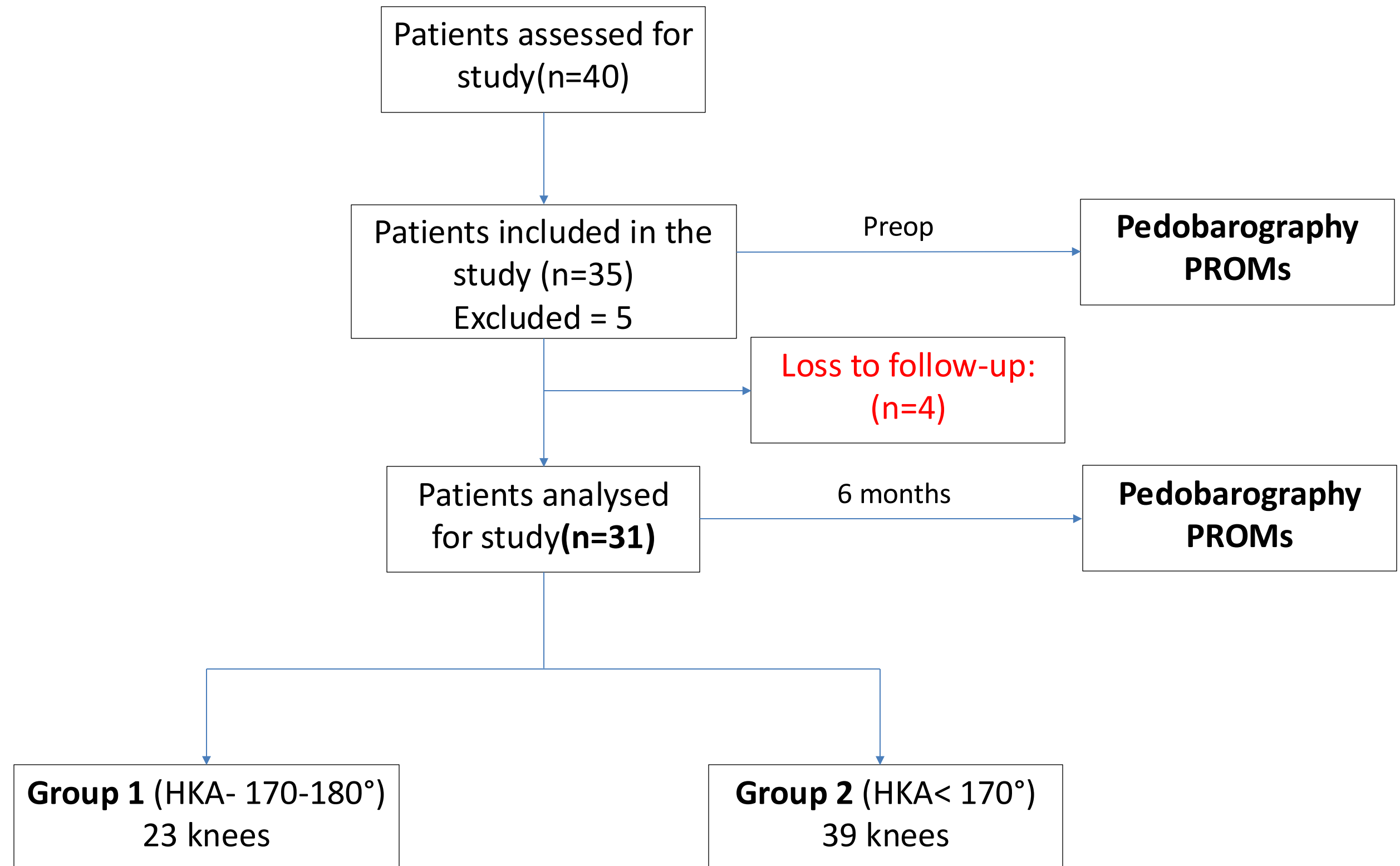
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Study flowchart





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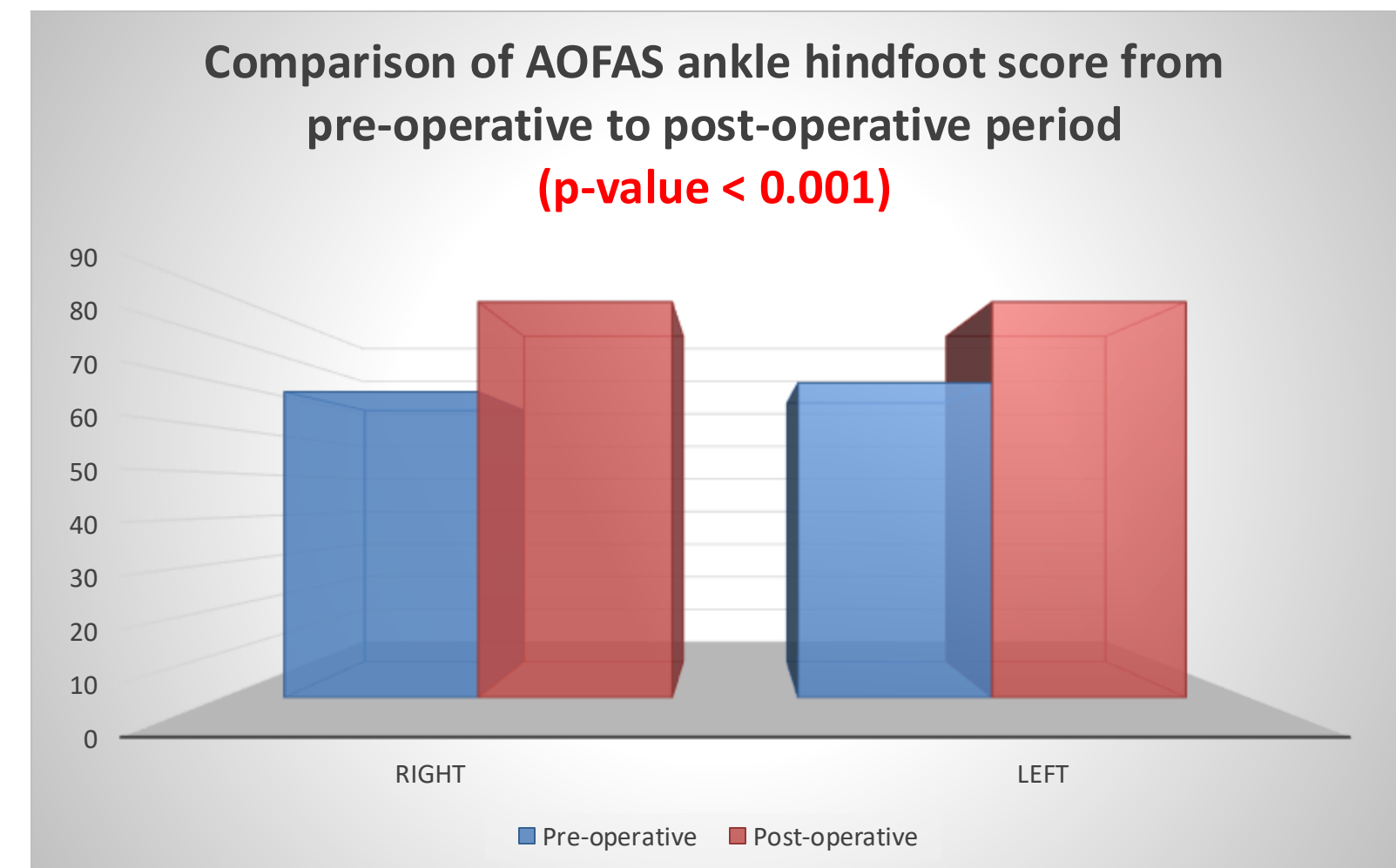
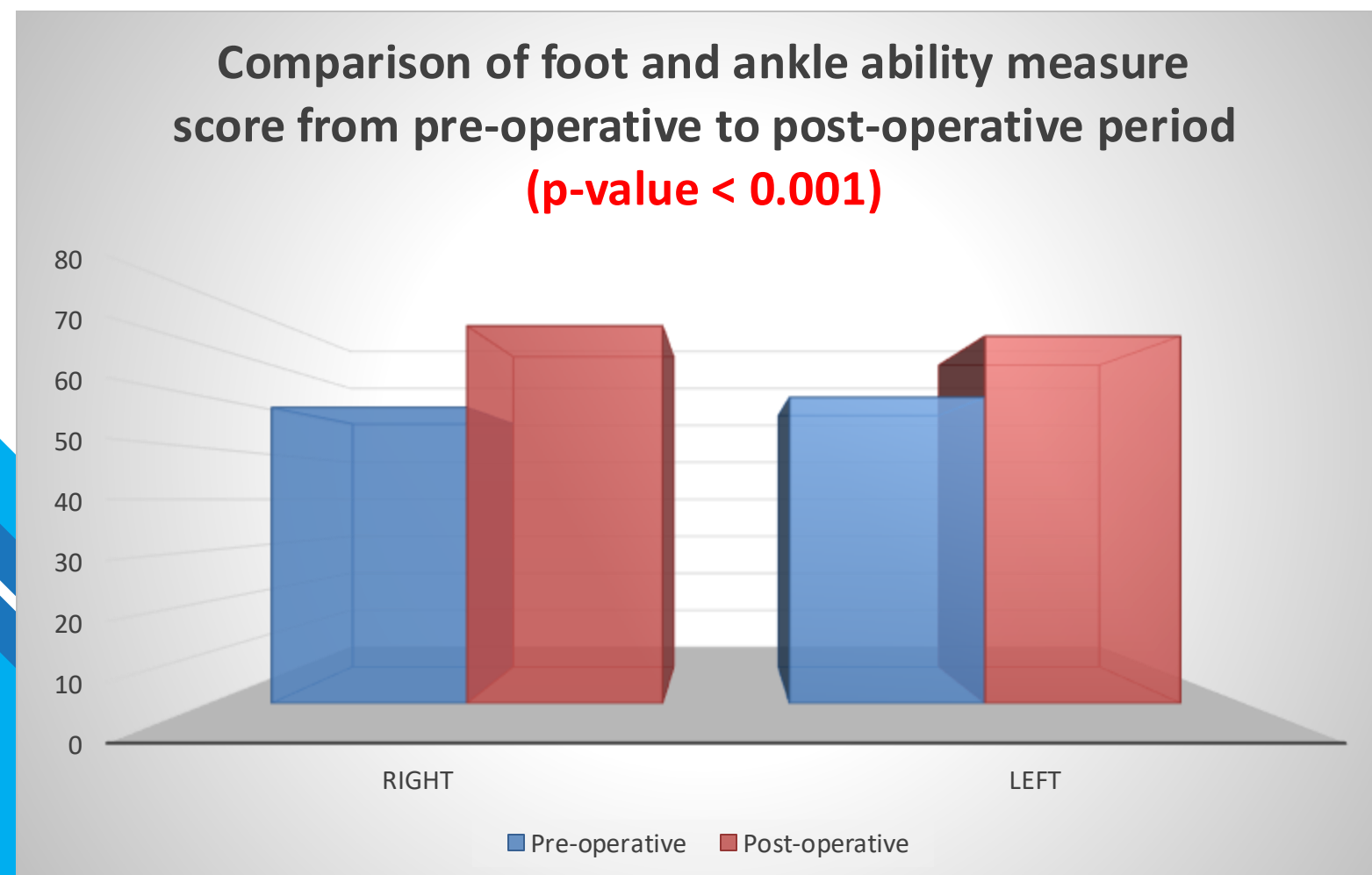


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Results

- Mean age: 61.42 ± 7.05 years, 95% C.I (58.93-63.90)
- Mean BMI: 28.68 ± 3.77 years, 95% C.I (27.35 – 30.01)
- Male : Female - 1:1.58





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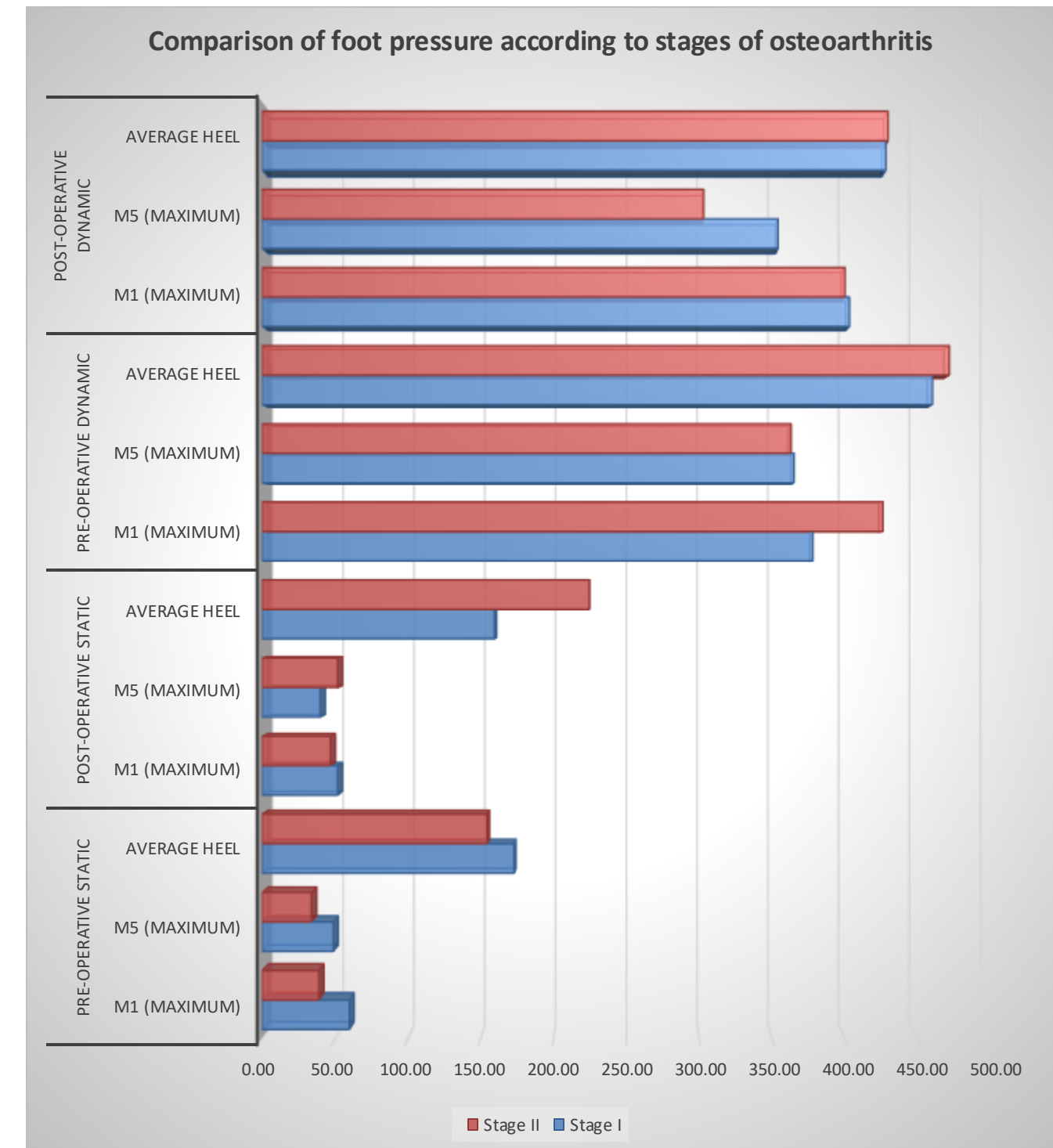


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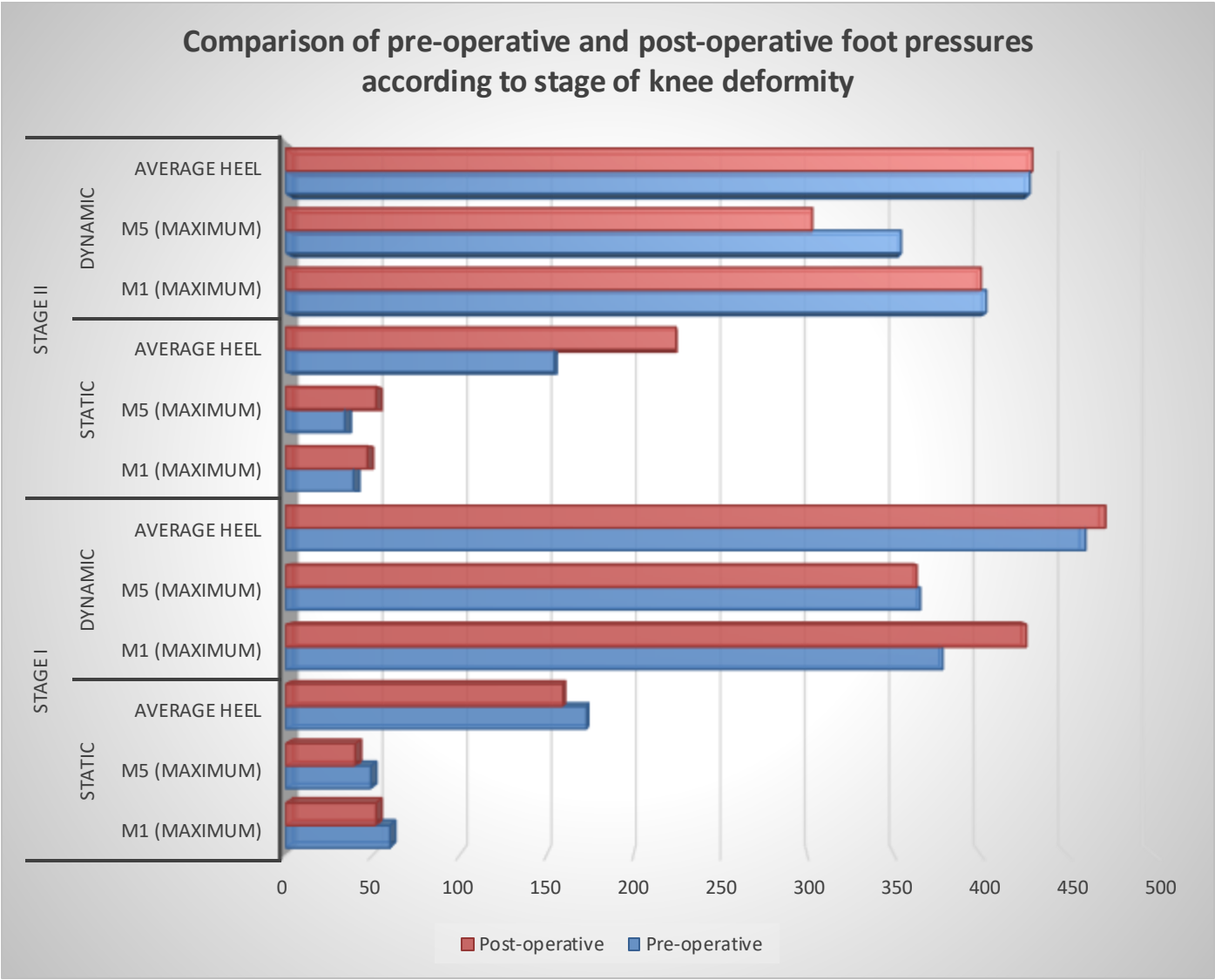
Results

		Median (IQR)		p-value
		Group I	Group II	
Pre-operative static	M1 (Maximum)	60 (19 - 94)	39 (22 - 58)	0.097
	M5 (Maximum)	49 (29 - 68)	34 (18 - 54)	0.029
	Average heel	173 (153.5 - 217.5)	154.5 (101.5 - 210.5)	0.137
Post-operative static	M1 (Maximum)	52 (16 - 87)	47 (30 - 97)	0.374
	M5 (Maximum)	40 (14 - 58)	52 (23 - 80)	0.155
	Average heel	159.5 (112.5 - 192.5)	224.5 (136 - 311.5)	0.028
Pre-operative dynamic	M1 (Maximum)	378 (258 - 830)	426 (288 - 554)	0.646
	M5 (Maximum)	365 (162 - 548)	363 (277 - 570)	0.737
	Average heel	460 (300.5 - 606.5)	471.5 (321 - 569)	0.754
Post-operative dynamic	M1 (Maximum)	403 (268 - 591)	400 (307 - 559)	0.907
	M5 (Maximum)	354 (258 - 444)	303 (169 - 480)	0.406
	Average heel	428 (295.5 - 537.5)	429.5 (307.5 - 603.5)	0.610



Results

Group			Median (IQR)		p-value
			Pre-operative	Post-operative	
Group I	Static	M1 (Maximum)	60 (19 - 94)	52 (16 - 87)	0.495
		M5 (Maximum)	49 (29 - 68)	40 (14 - 58)	0.026
		Average heel	173 (153.5 - 217.5)	159.5 (112.5 - 192.5)	0.181
	Dynamic	M1 (Maximum)	378 (258 - 830)	426 (288 - 554)	0.212
		M5 (Maximum)	365 (162 - 548)	363 (277 - 570)	0.254
		Average heel	460 (300.5 - 606.5)	471.5 (321 - 569)	0.330
Group II	Static	M1 (Maximum)	39 (22 - 58)	47 (30 - 97)	0.040
		M5 (Maximum)	34 (18 - 54)	52 (23 - 80)	0.052
		Average heel	154.5 (101.5 - 210.5)	224.5 (136 - 311.5)	0.001
	Dynamic	M1 (Maximum)	403 (268 - 591)	400 (307 - 559)	0.548
		M5 (Maximum)	354 (258 - 444)	303 (169 - 480)	0.023
		Average heel	428 (295.5 - 537.5)	429.5 (307.5 - 603.5)	0.630





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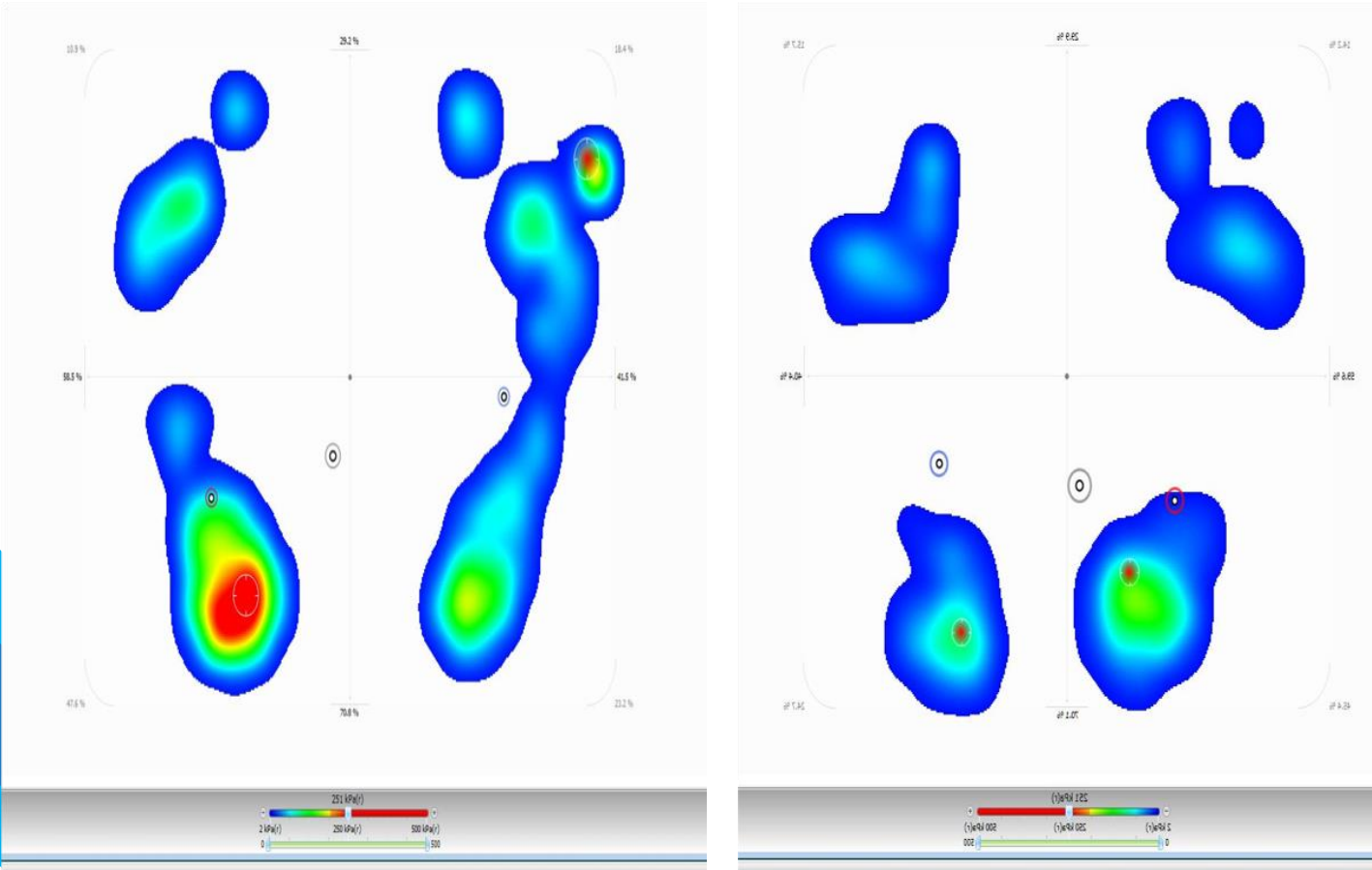


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Discussion and Conclusion

- Knee realignment- corrected alignment of foot and ankle
- Redistribution of pressure from lateral to medial side
- Change more significant in dynamic analysis
- Change more pronounced in greater degrees of varus
- Significant improvement in ankle PROMs postoperatively



Preoperative

Postoperative



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References

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