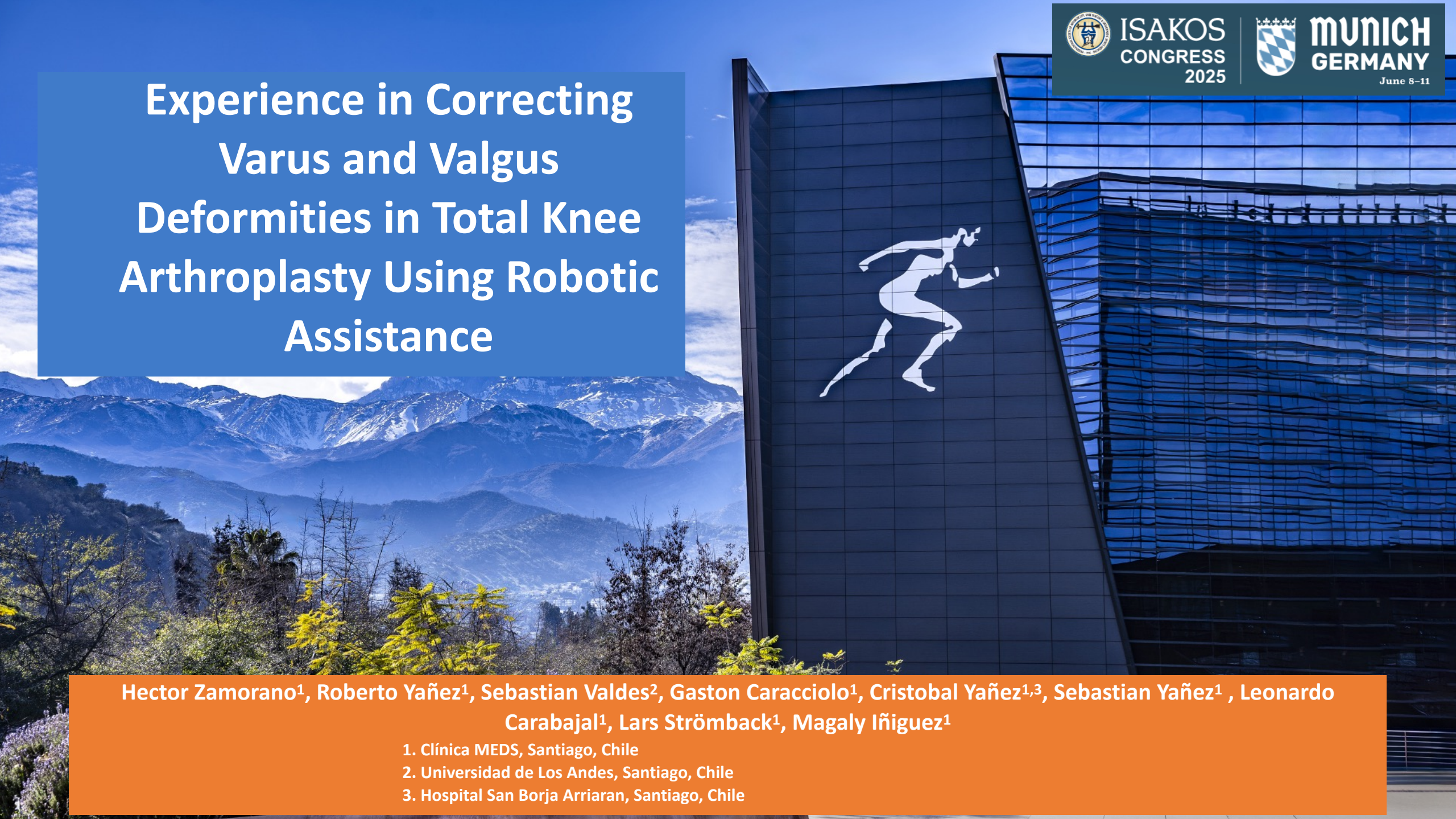

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Experience in Correcting Varus and Valgus Deformities in Total Knee Arthroplasty Using Robotic Assistance

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Faculty Disclosure Information

- Nothing to disclosure with this presentation.

Introduction

- Total knee arthroplasty (TKA) is a commonly performed procedure in orthopedic surgery.
- Recent advancements in TKA include the development of robot-assisted systems (rTKA).
- Achieving proper knee alignment is crucial for determining the success of TKA, and this has shifted from a mechanical balancing approach to a more personalized one, primarily based on soft tissue balancing.

Objective

- Determining the degree of correction of knee radiographic malalignment following rTKA.

Methods

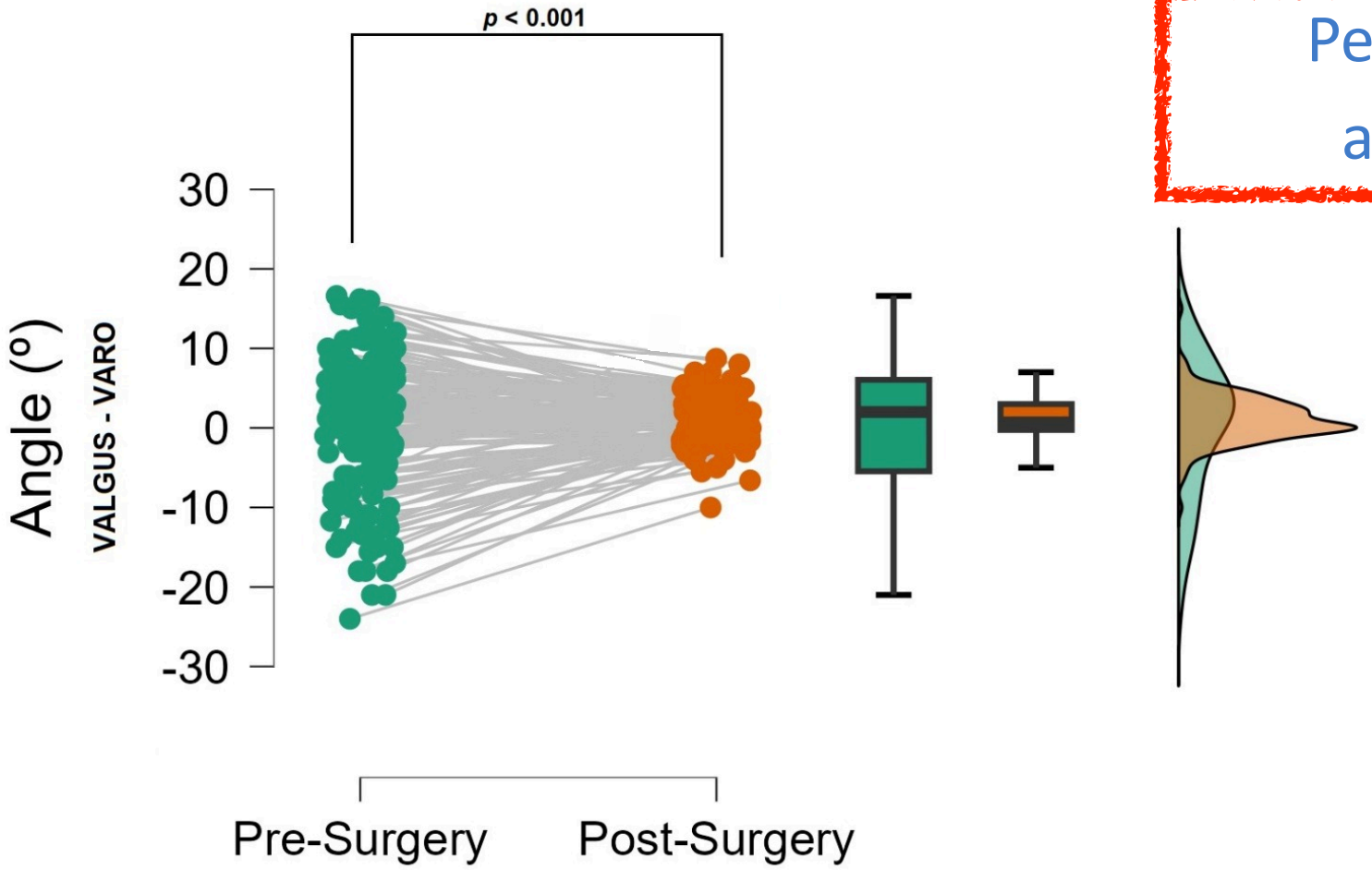
- A total of 155 patients indicated for TKA were prospectively enrolled between 2021 and 2024.
- All patients underwent robot-assisted TKA with the assistance of ROSA® (Zimmer Biomet).
- A preoperative and postoperative (3 months) lower limb AP radiographic study was performed.
- The change in alignment was compared using a one-tailed paired t-test (α=5%). Normality was assessed using the Shapiro-Wilk test. The effect size was described using Cohen's d.

Results

PREOPERATIVE	CASES	MAGNITUDE
VARUS ALIGNMENT	89	6,3° ±4,2° [0,7–16,6°]
NEUTRAL ALIGNMENT	5	
VALGUS ALIGNMENT	61	8,4° ±6.0° [0,2–24°]

POSTOPERATIVE	CASES	MAGNITUDE
VARUS ALIGNMENT	40	3,0° ±2,3° [0,1–10°]
NEUTRAL ALIGNMENT	27	
VALGUS ALIGNMENT	88	2,3° ±1,9° [0,1–10°]

Correction of preexisting knee axes



Personalized alignment

Clinical case:

- Female, 79 years old, with a long history of progressive pain in the right knee.
- Right genuvalgum of 26°

- Postoperative:
  - Zimmer Biomet Persona prosthesis with an additional 30 mm stem.
  - Final right genuvalgum of 2°.

Conclusions & Discussion

- Robot-assisted TKA (rTKA) with ROSA® (Zimmer Biomet) is effective in correcting malalignment caused by knee osteoarthritis.
- There is a significant reduction in preoperative deformity in the postoperative period for both varus and valgus deformities.
- This is consistent with other studies showing that the correction of varus and valgus deformities during rTKA has proven to be effective compared to conventional arthroplasty.
- It is important to consider how effective teleradiography is as a postoperative evaluation method, particularly with the shift from mechanical to personalized alignment.

References

- Kort N, Stirling P, Pilot P, Müller JH. Robot-assisted knee arthroplasty improves component positioning and alignment, but results are inconclusive on whether it improves clinical scores or reduces complications and revisions: a systematic overview of meta-analyses. Knee Surg Sports Traumatol Arthrosc. 2022.
- Marchand RC, Sodhi N, Khlopas A, Sultan AA, Higuera CA. Coronal Correction for Severe Deformity Using Robotic-Assisted Total Knee Arthroplasty. J Knee Surg. 2018.
- Marchand RC, Khlopas A, Sodhi N, Condrey C, Piuzzi NS, Patel R, Delanois RE, Mont MA. Difficult Cases in Robotic Arm-Assisted Total Knee Arthroplasty: A Case Series. J Knee Surg. 2018.