Analysis of Hospital Outcomes and Complications in Robot-Assisted Primary Total Knee Replacement Versus Conventional Surgery: A Cohort Study.

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INTRODUCTION

Gonarthrosis → exponential incidence [1,2,5]

Up to 20% of patients are NOT satisfied with knee arthroplasty [3,4]

Development of robotic systems → improve satisfaction, bone cuts, alignment... [1,2,6,9]

Hypothesis: *"Robot-assisted surgery is associated with better hospital outcomes and a lower complication rate compared to conventional surgery."*

MATERIALS AND METHODS

Retrospective cohort

2 Robotic Arthroplasty surgery accredited surgeons *(ROSA, Zimmerbiomet (R)*.

n = 250 (185 cTKA; 65 ROSA Image-less rTKA).

Same perioperative protocol (ERAS)

Statistical analysis using R software

Inclusion Criteria	Exclusion Criteria
>18 years	<18 years
Grade III-IV gonarthrosis	Unicompartimental arthroplasty
Primary TKA	Revision arthroplasty

Table 1: Inclusion and Exclusion Criteria
cTKA: convenctional Total Knee Arthroplasty
rTKA: robot assisted Total Knee Arthroplasty
ERAS: Enhanced Recovery After Surgery

MATERIALS AND METHODS

Demographics	Hospital indicators	Complications
Age	Length of stay	Infections
Sex	Time to first sitting, ambulation, stairs	Readmissions (<90 days)
ASA	Analgesic rescue	
	Blocks	
	Hemoglobin loss	

Table 2: Types of variables analyzed
ASA: Americas Society of Anesthesiologist Classification

RESULTS

	cTKA (n=185)	rTKA (n=65)	p valor
Sex (% women)	69,18	60	**0,23**
Laterality (% right)	50	52,30	**0,86**
Age (mean)	72,26 (64,37-80,49)	71 (63,83-78,17)	**0,236**
ASA I (%)	8,10	7,69	**0,1**
ASA II (%)	64,32	80	
ASA III (%)	27,50	12,30	

Table 3: Demographic characteristics in cTKA and rTKA; n=250 *p-value from Pearson or Wilcoxon test (statistically significant differences with p<0.05)*

ASA: American Society of Anesthesiologists Classification

RESULTS

	cTKA (n=185)	rTKA (n=65)	p valor
Length of stay (days)	3,63	3,44	**0,256**
Sitting time (days)	0,29	0,46	**0,57**
Ambulation (days)	0,36	0,5	
Stairs (days)	2	1,47	
Analgesic rescue (%)	4,75	1,92	**0,218**
Blocks (%)	16,75	27,69	**0,08**
Nausea and vomits (%)	2,9	2,12	**0,689**
Hemoglobin loss (g/dL)	2,36 (1,34-3,38)	2,14 (1,18-3,1)	**0,389**
Infections (%)	1,08	0	**0,12**
Readmissions (%)	2,16	1,53	

Table 4: Characteristics of hospital indicators in cTKA and rTKA; n=250 *p-value from Pearson, Wilcoxon, or T-Student test (statistically significant differences with p<0.05)*

Note: *No significant difference was observed between both groups.*

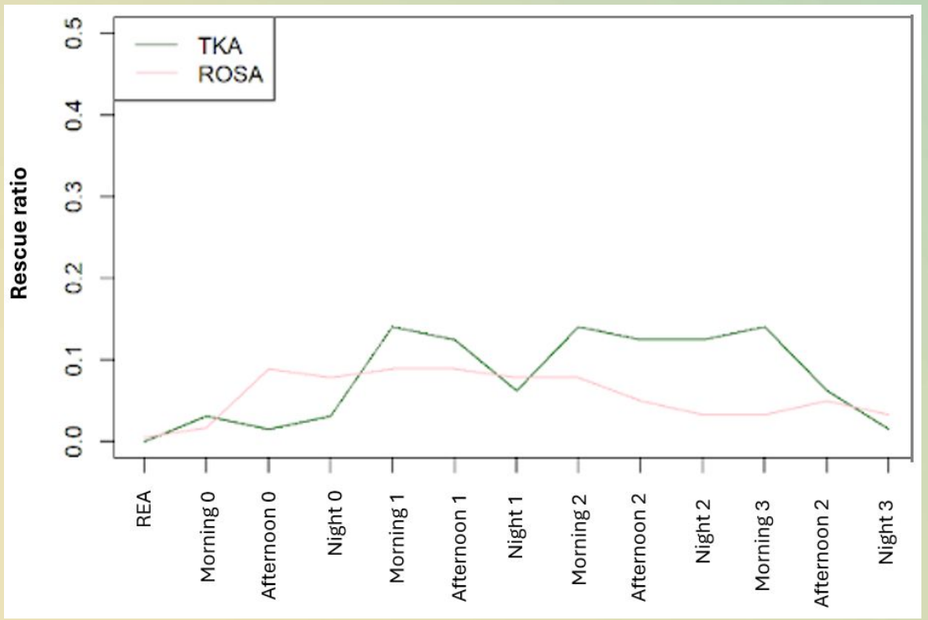

Chart 1: Proportion of analgesic rescues in cTKA vs rTKA (p with T-Student)

No significant differences

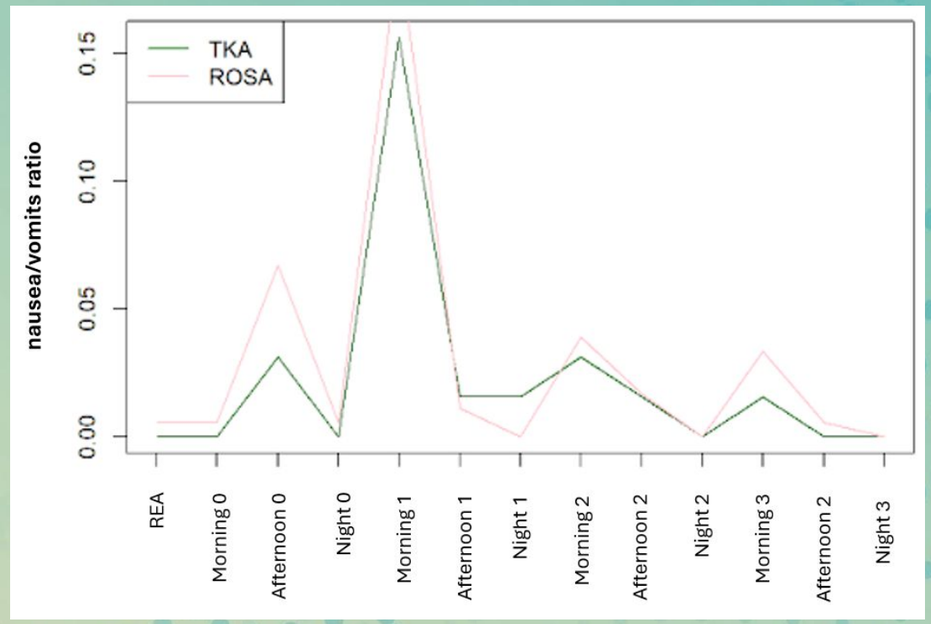

Chart 2: Proportion of vomiting in cTKA vs rTKA (p with T-Student)

No significant differences

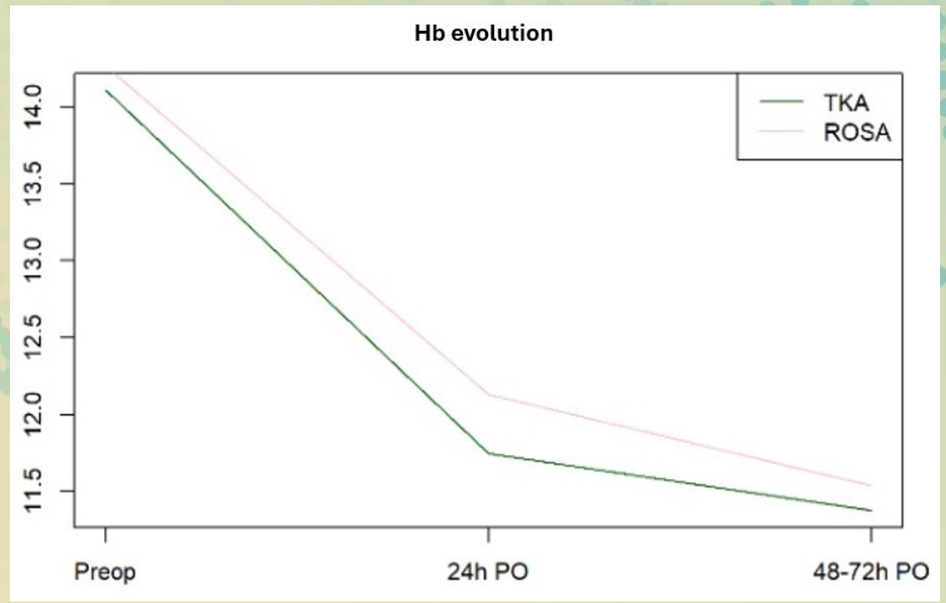

Chart 3 Hemoglobin loss within 72:h postoperatively in cTKA vs rTKA (p with T-Student)

No significant differences

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DISCUSSION

LIMITATIONS:

- Retrospective study
- Selection criteria depended on the surgeon
- Some factors (e.g., analgesia) depend on logistical issues

STRENGTHS:

- Relatively large sample size
- Same perioperative protocol
- Parameters analyzed differ from other studies

	Year	Type of study	Radiological parameters	Functional outcomes
Alrajeb et al.[1]	2024	Systematic Review, Meta-Analysis (1)	Significant differences	**No significant differences** (0-10 years)
Ruangsomboom et al.[2]	2023	Systematic Review, Meta-Analysis (1)	Significant differences	**No significant differences** (6 weeks – 4 years)
Fozo et al.[5]	2023	Systematic Review, Meta-Analysis (1)	No significant differences	**No significant differences** (0-10 years)
Kort et al.[6]	2022	Systematic Review, Meta-Analysis (1)	Significant differences	**No significant differences** (0-10 years)
Fang et al.[7]	2021	Retrospective Cohort (3)	-	Significant differences (postop)
Ofa et al.[4]	2020	Restrospective Cohort (3)	-	Significant differences (3, 6, 12 months)
Kim et al.[3]	2020	Randomized Clinical Trial (1)	No significant differences	**No significant differences** (13 +/- 5 years)
Kayani et al.[8]	2019	Prospective Cohort (3)	-	Significant differences (postop)
Kayani et al.[9]	2019	Systematic Review (1)	Significant differences	**No significant differences** (2-10 years)

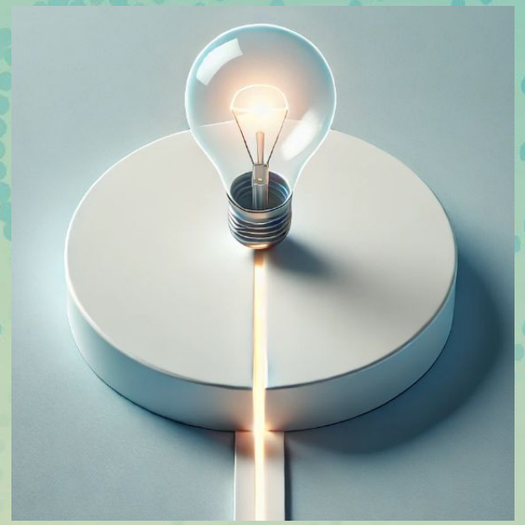
Table 5: Results of radiological and functional parameters from recently published studies according to the level of evidence and grade of recommendation from SIGN (Scottish Intercollegiate Guidelines Network).

CONCLUSIONS

No statistically significant differences were observed in clinical outcomes or complications between the two groups.

Results are **similar** to those reported in recently published articles.

It appears that there may be greater alignment precision according to the literature, but it is **unclear** whether this is associated with higher long-term patient satisfaction.



- Long-term prospective randomized studies are needed to evaluate cost-effectiveness.

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