

Introduction & Background

- Saphenous Nerve Blocks:** Standard for knee arthroplasty pain management.
- Current Practice:** Performed using ultrasound guidance.
- Challenge:** Providers must shift focus between the needle site and the ultrasound screen.
- Issue:** Head movement delays the procedure.
- Innovation:** Smart glasses connected to the ultrasound machine. Allows direct viewing of ultrasound images without looking away.
- Primary Objective:** Evaluate if smart glasses reduce nerve block procedure time.
- Secondary Objective:** Analyze provider’s head movement and ergonomics.

Methods

- IRB Approval:** Obtained before the study.
- Data Collection:** Recorded key time points, needle adjustments, and ergonomics.
- Study Design:** Randomized between standard method and smart glasses.
- Operators:** Residents of different training levels, supervised by an attending.
- Post-Procedure:** Providers completed a survey on method preference.

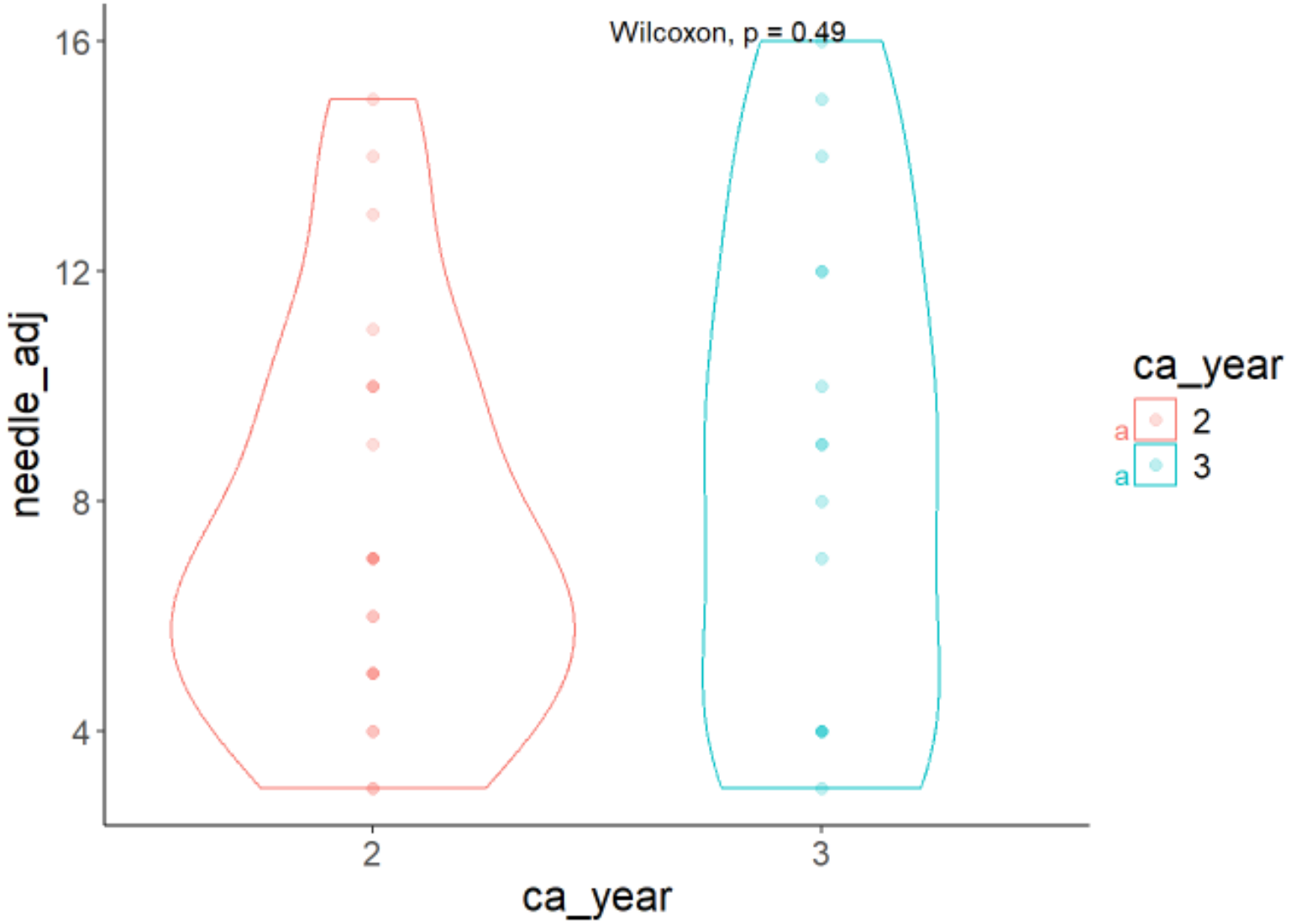
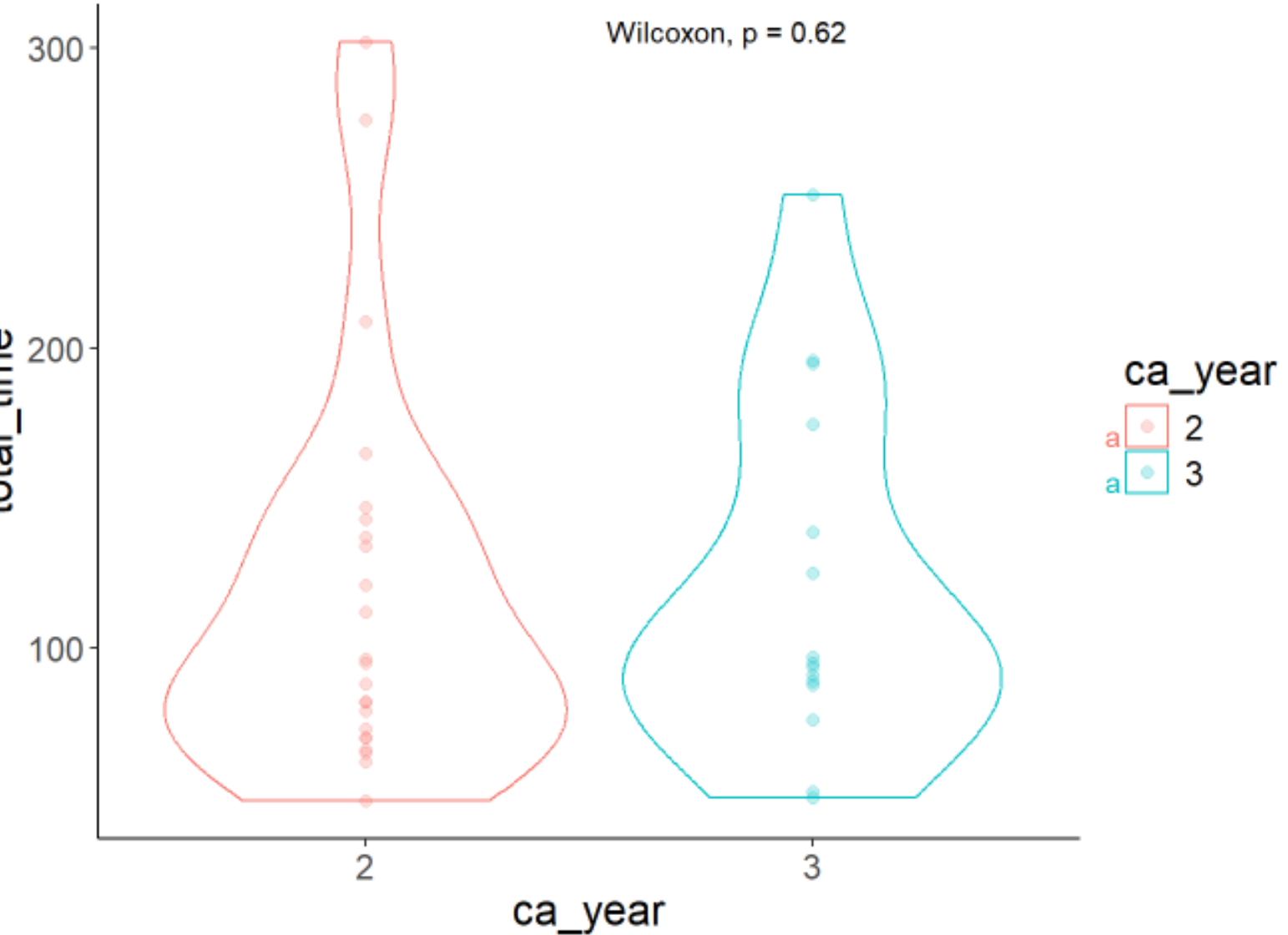
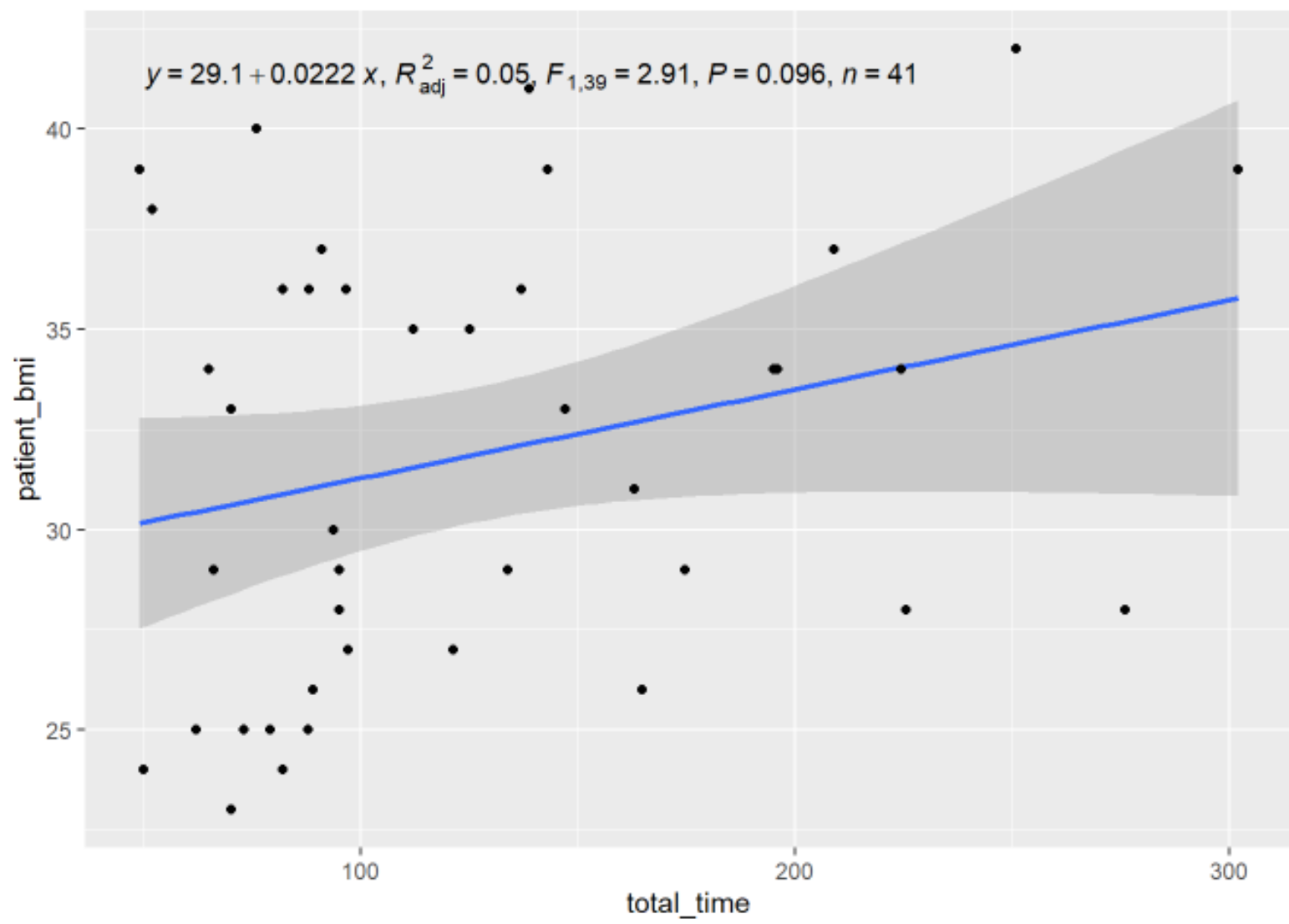
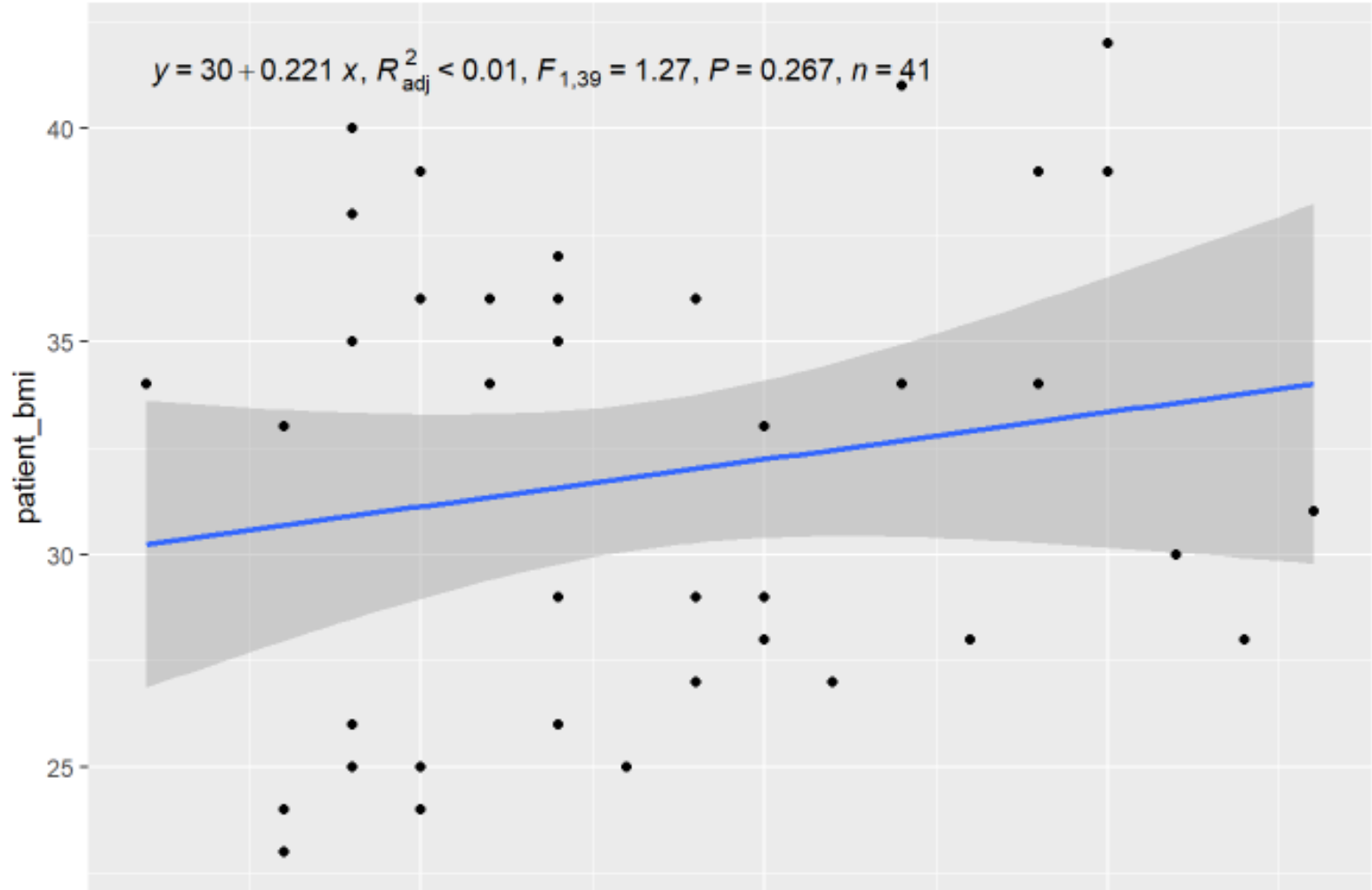


Results

Characteristic	smart, N = 12 ¹	soc, N = 12 ¹	p-value ²
Insertion time			0.4
Mean (SD)	41 (34)	26 (14)	
Median (25%,75%)	29 (22,45)	25 (15,36)	
[Range]	[8 - 111]	[7 - 54]	
Needle adjustments			0.2
Mean (SD)	10 (5)	7 (4)	
Median (25%,75%)	9 (7,13)	6 (4,9)	
[Range]	[3 - 18]	[3 - 14]	
Head adjustments			0.2
Mean (SD)	4 (3)	6 (6)	
Median (25%,75%)	2 (1,6)	5 (3,8)	
[Range]	[1 - 10]	[1 - 19]	
Anesthetic finish time			0.4
Mean (SD)	83 (50)	87 (79)	
Median (25%,75%)	62 (48,103)	51 (40,83)	
[Range]	[38 - 192]	[38 - 257]	
Total procedure time			0.4
Mean (SD)	133 (64)	121 (86)	
Median (25%,75%)	122 (84,173)	78 (66,144)	
[Range]	[49 - 251]	[50 - 302]	
Patient age			0.4
Mean (SD)	64 (10)	67 (10)	
Median (25%,75%)	61 (58,73)	68 (59,75)	
[Range]	[54 - 83]	[55 - 83]	
Patient BMI			0.4
Mean (SD)	32 (6)	30 (6)	
Median (25%,75%)	32 (27,35)	29 (25,35)	
[Range]	[25 - 42]	[23 - 40]	
Ultrasound probe			
Linear	12 (100%)	12 (100%)	
Laterality			0.4
Left	8 (67%)	6 (50%)	
Right	4 (33%)	6 (50%)	
Arthroplasty			>0.9
Primary	12 (100%)	11 (92%)	
Revisionary	0 (0%)	1 (8.3%)	
Resident CA year			
3	1 (100%)	2 (100%)	
Unknown	11	10	

¹n (%)

²Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test



- Insertion Time:** Similar between groups (p = 0.4).
- Needle Adjustments:** No significant difference (p = 0.2).
- Head Adjustments:** No significant difference (p = 0.2).
- Anesthetic Finish Time:** Comparable between groups (p = 0.4).
- Total Procedure Time:** No significant difference (p = 0.4).
- Patient Age:** Similar between groups (p = 0.4).
- Patient BMI:** Comparable (p = 0.4).
- Laterality:** No significant difference (p = 0.4).
- Arthroplasty Type:** Mostly primary procedures (>0.9).
- Resident CA Year:** Similar distribution.

Discussion and Conclusion

The study found no significant differences between the smart glasses group and the standard approach in terms of insertion time, needle adjustments, head adjustments, anesthetic finish time, total procedure time, patient demographics, or procedural factors. While it was an interim analysis with only 25 patients enrolled, the results remain inconclusive. Further research is needed to determine their potential benefits in clinical practice.