

Early Postoperative Cognitive Outcomes Following Awake Surgery Under Local Anesthesia: A Prospective Cohort Study

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Introduction

- Postoperative cognitive dysfunction (POCD) affects about 1 in 4 adults over 60 one week after noncardiac surgery under general anesthesia.¹
- Two explanations compete. Surgical trauma may drive neuroinflammation,² or systemic anesthetics and sedatives may injure neurons directly.³
- Regional versus general anesthesia trials could not separate the two, because many regional patients still received IV sedation (37% in ISPOCD2, 88% propofol in REGAIN).^{4,5}
- Awake plastic surgery under local anesthesia alone keeps the surgical trauma and removes systemic anesthetic exposure.**

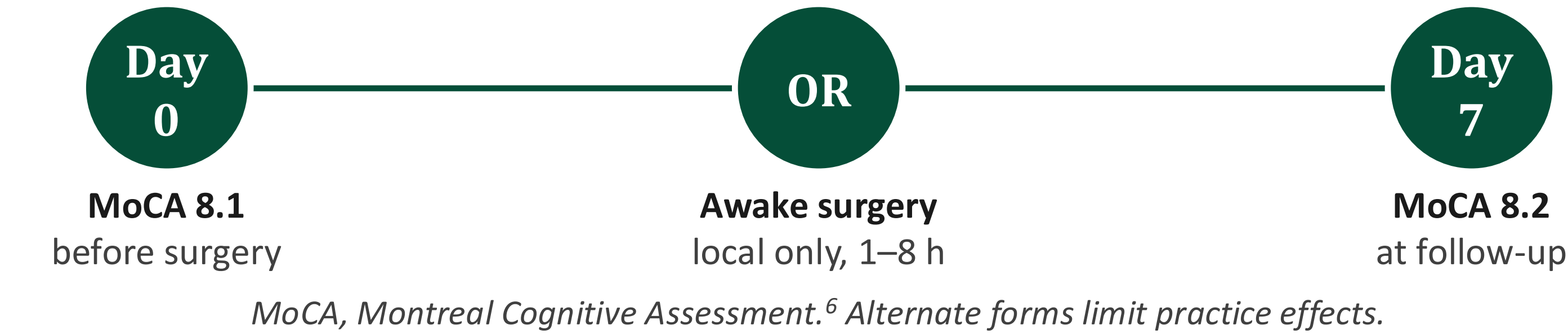
Isolating surgical trauma from anesthesia

	Surgical trauma	Systemic anesthetic or sedation	Early decline (1 week)
Surgery under general anesthesia	Yes	Yes	≈25% ¹
Awake surgery, local only (this study)	Yes	None	?

Objective

Test whether surgical trauma alone, without any systemic anesthetic or sedative, produces early cognitive decline in adults aged 50 and older.

Methods



- Prospective cohort at one private plastic surgery practice in Los Angeles, August 2024 to June 2026. One surgeon performed every case.
- 50 adults aged 50 to 87 (ASA I–II) had blepharoplasty (n = 29) or facelift and neck lift ± blepharoplasty (n = 21).
- Patients stayed awake throughout, with lidocaine and epinephrine (1:100,000) below 7 mg/kg. No one received premedication, anxiolytics, opioids, IV sedatives, or hypnotics.
- 50 nonsurgical controls of similar age and education followed the same 7-day testing schedule.
- We defined decline a priori as a drop of ≥3 MoCA points and compared change with a linear mixed-effects model adjusted for age.

Limitations & Next Steps

- One surgeon at one center, healthy ASA I–II patients, and facial procedures with less inflammatory burden than major abdominal or orthopedic surgery.
- The MoCA screens less finely than a full neuropsychological battery, and examiners knew group assignment. With 1 event in 50 patients, the 95% CI for decline spans 0.05% to 10.6%.
- Multicenter replication in hand, dermatologic, and general surgery, with longer follow-up, would test how far these findings extend.

Results

Participants

	Control (n = 50)	Surgery (n = 50)	p
Age, years	67.3 ± 10.6	66.5 ± 9.9	0.690
Baseline MoCA	25.1 ± 2.4	26.0 ± 3.0	0.115

Mean ± SD, independent-samples t tests. All 50 approached surgical patients enrolled, and every participant completed follow-up.

2%

≥3-point MoCA decline in each group (1 surgical patient, 1 control)

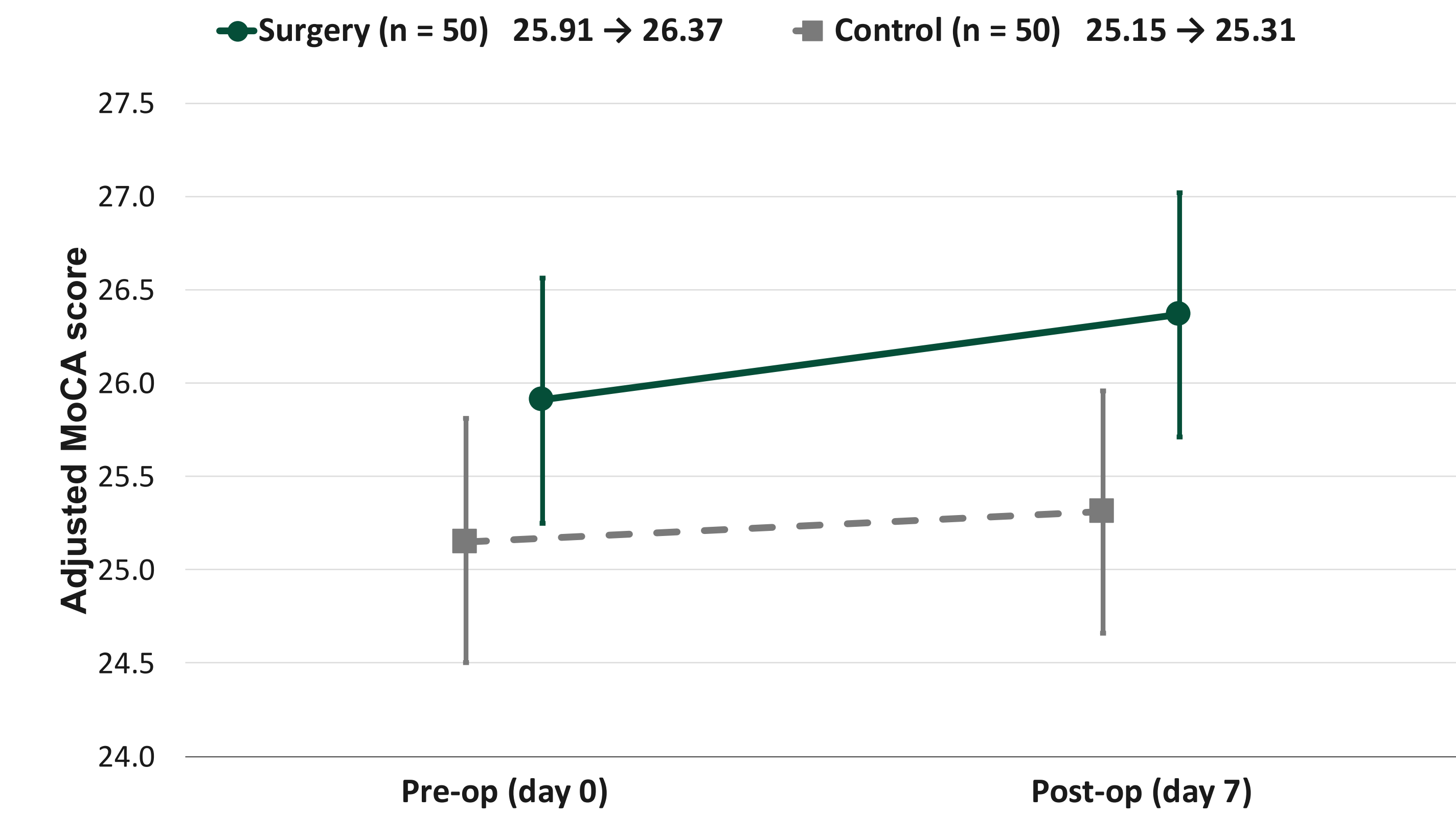
p = 0.198

Time × group interaction. Change after surgery matched controls

6–8 h

Longest awake cases, with no link between surgical extent and change

Figure 1. MoCA before and 1 week after surgery



Age-adjusted means from the mixed-effects model with 95% CIs. Both groups rose slightly, consistent with retest effects.

Linear mixed-effects model of MoCA score

Predictor	β (95% CI)	p
Time (post-op vs pre-op)	0.16 (−0.16 to 0.48)	0.330
Surgery vs control	0.76 (−0.17 to 1.68)	0.109
Age (per year)	−0.13 (−0.17 to −0.08)	<0.001
Time × surgery	0.30 (−0.16 to 0.76)	0.198

MoCA ~ time × group + age + (1 | participant). The interaction row tests whether change differed between groups.

Categorical outcomes

Outcome	Control	Surgery	p
≥3-point MoCA decline	1 (2%)	1 (2%)	1.000
Fell from ≥26 to <26	1 (2%)	2 (4%)	1.000

n (%), Fisher exact tests.

Surgical Subgroups

Subgroup	n	Change in MoCA (95% CI)	Δ (95% CI)
Age group, years			
50–60	16	0.75 (0.09 to 1.41)	0.75 (0.09 to 1.41)
61–70	14	0.07 (−0.79 to 0.93)	0.07 (−0.79 to 0.93)
71–80	13	0.31 (−0.31 to 0.93)	0.31 (−0.31 to 0.93)
>80	7	0.86 (−0.78 to 2.50)	0.86 (−0.78 to 2.50)
Procedure			
Blepharoplasty	29	0.34 (−0.23 to 0.91)	0.34 (−0.23 to 0.91)
Facelift + neck lift ± blepharoplasty	21	0.62 (0.11 to 1.13)	0.62 (0.11 to 1.13)

Mean within-patient change, post-op minus pre-op. Time × procedure interaction p = 0.482.

Discussion

- Scores held steady or rose in every age group, including patients older than 80, and in both procedure groups.
- The 95% CI for the group difference in change (−0.16 to 0.76) argues against a meaningful mean decline after awake surgery.
- Patients who had facelift and neck lift (up to 6–8 hours) changed no more than blepharoplasty patients, so surgical extent showed no dose-response.
- Scores ran 0.13 points lower per year of age (p < 0.001), so the test picked up real differences. Older patients still did not decline.
- Prior “regional” arms often included systemic sedation. Removing it points to systemic anesthetic exposure as one potential contributor to POCD.

Key Finding

Adults aged 50 to 87 showed no early cognitive decline after awake surgery under local anesthesia alone.

Conclusion

Surgical stress alone may not suffice to cause early POCD. For older adults, anesthetic technique is a modifiable part of surgical care, and local anesthesia alone avoids one potential contributor to early cognitive decline.

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