Cortical laterality shift during a muscle test, with Q-Technology

EEG analysis (left middle deltoid) — the cortex reorients toward the hemisphere that commands the tested arm

Level of evidence : Observed in-house (frontal EEG signal, laterality index) — exploratory observation, n = 1, short window; force judged by manual testing (not instrumented)

Analysis type	Exploratory EEG observation, within-subject, without Q vs with Q
Participant	One subject, one session
Measure	Muse EEG (Athena), frontal sensors AF7/AF8
Test	Manual resisted muscle test — left middle deltoid, weak at baseline
Q circuit	Q-Theta (full effect in ~12 s)
Marker used	Laterality index (R−L)/(R+L) per band — independent of level
Windows	Brief (14 s without, 18 s with), matched to the test durations
Status	Descriptive observation — force judged by manual testing, not instrumented

Summary

Second EEG analysis in the series, on a manual muscle test of the left middle deltoid. The marker used is not the global activity level (unreliable over a short window with unstable contact), but the left/right balance — the laterality index (R−L)/(R+L) per band, independent of level. Result: with Q-Theta, slow and medium activity (Delta, Theta, Alpha) shifts clearly from the left to the RIGHT — the hemisphere that commands the tested left arm (crossed pathways). The direction of the signal therefore follows anatomy, not chance. Exploratory observation (force was judged by manual testing); it is not a demonstration, and the document states how to instrument it.

1. Background and objective

Manual muscle testing often runs into a sterile debate: “it works” versus “it’s subjective, it’s the examiner.” Rather than answer with an opinion, this analysis shifts the question: what does the cortex do at the precise moment a “weak” muscle becomes “strong” again?

To frame it up front: EEG does not measure force here (the manual test does). It serves to observe what the cortex does during the test window — signs of compensation, of tension, or a change in sensorimotor processing. Hence deliberately short recordings, matched to the test durations.

2. Method

Targeted EEG protocol:

- Participant: one subject, one session.
- Test: manual resisted muscle test on the left middle deltoid, judged weak at baseline.
- Sequence: (1) test without Q-Theta → the muscle gives way; (2) Q-Theta applied (full effect in ~12 s); (3) re-test → the muscle holds.
- EEG: Muse (Athena), frontal sensors AF7/AF8; brief windows (14 s without, 18 s with), matched to the test durations.
- Data: laterality index (R−L)/(R+L) per frequency band, recomputed from the raw CSV.

- Important: force is judged by manual testing (not instrumented). EEG observes the cortex; it does not measure force.

3. The right marker — laterality, not the global level

An honest first reflex. With Q-Theta, all bands rise in absolute level. But over 14–18 seconds with imperfect electrode contact, this global level is not reliable: it can reflect contact or arousal as much as a real effect. So we do not rely on it.

What is informative is the left/right BALANCE, which is free of level: the laterality index (R−L)/(R+L) per band. A negative index leans left, a positive one leans right. It is this marker, and this one only, that we read here.

4. Results — the laterality shift

OBSERVATION Laterality index (R−L)/(R+L) per band — slow and medium activity shifts toward the right.

Band	Without Q-Theta	With Q-Theta	Shift	Direction
Delta	−0.03	**+0.43**	+0.46	→ RIGHT
Theta	−0.57	**+0.52**	+1.09	→ RIGHT
Alpha	−0.21	**+0.56**	+0.77	→ RIGHT
Beta	−0.57	−0.51	+0.06	~ stable
Gamma	−0.32	−0.53	−0.21	← left

Three bands out of five shift clearly to the right: Delta, Theta and Alpha — the slow and medium activity — all move from a left-leaning balance to a right-leaning one (+0.46 to +1.09). Beta stays stable, and Gamma makes a small move the other way.

The clearest signal is therefore concentrated on the slow and medium waves, and it points in a single direction.

5. Clinical reading — the cortex reorients toward the right hemisphere

The neurological detail that gives the shift its meaning: the LEFT deltoid is commanded by the RIGHT motor cortex (the pathways are crossed). If something relevant happens for this arm, the right side is where to look.

That is exactly the direction of the shift. Without Q-Theta, slow/medium activity leaned left (ipsilateral to the weak muscle); with Q-Theta, as the muscle becomes strong again, it shifts to the right — the hemisphere that drives the tested limb. The brain seems to reorient its resources toward the right side.

A word on frontal activation: the frontal Beta/Alpha ratio is higher with Q-Theta from the first second. Technical honesty: beyond the first ~5 seconds, the device holds frozen values (repeated plateaus); only this short true window is informative. Over it, activation is more marked with Q-Theta — consistent with sensorimotor mobilization during effort, not with relaxation.

6. What this shifts in the debate

Most debates about muscle testing go in circles: “it works” versus “it’s subjective.” This observation shifts the conversation. We do not ask anyone to believe the test: we show that at the moment of

the test, something independent and measurable — the electrical activity of the cortex — reorganized toward the expected hemisphere.

It is not definitive proof, and we do not present it as such. It is an objective clue, whose direction follows anatomy rather than chance. For a muscle-testing practitioner, it is a cortical fingerprint accompanying the change felt under the fingers; for a laboratory audience, it is a lead to be confirmed by an instrumented protocol.

7. Limitations

- n = 1, one session, fixed order (without then with), non-blinded.
- Force judged by manual muscle testing (not instrumented) — a clinical field tool, not an objective force measurement.
- Very short window (~15 s), partially frozen by the device → no statistical inference.
- Imperfect EEG contact, TP10 sensor partially failing → analysis limited to frontals (AF7/AF8).
- Laterality is descriptive: it describes an observed pattern, it does not prove a mechanism.

8. Turning the observation into proof

To move from observation to proof:

- Instrument force (dynamometer / force sensor) to replace the manual judgment.
- Add blinding + a sham condition: operator and subject not knowing when Q-Theta is active.
- Longer, repeated windows (several weak/strong cycles), a headband with stable contact (verified signal quality).
- Pre-register the criterion: Delta/Theta/Alpha laterality shift toward the contralateral hemisphere + objectified force, Q-Theta vs sham.

9. Conclusion

On this left-deltoid test, EEG shows one precise and defensible thing: with Q-Theta, slow and medium activity shifts toward the right hemisphere — the one that commands the tested arm. By choosing laterality over the global level, we read a marker robust to contact noise. The direction follows anatomy, not chance. But force was judged by hand and the window is short: this is an exploratory observation, not a demonstration. Proof will require instrumented force, a blinded sham, and a pre-registered criterion. Framing: an exploratory pilot study, to be confirmed, with no medical claim.

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Source: Muse EEG (Athena), frontal sensors AF7/AF8, laterality index (R−L)/(R+L) per band, recomputed from the raw CSV. Manual muscle test (force not instrumented). Unaudited internal data. Not a medical claim.