Shoulder abduction force, with and without Q-Technology

Instrumented pilot study on a dynamometer — objective force measurement (no EEG)

Level of evidence : Observed in-house — exploratory pilot study (n = 1, to be replicated)

Study type	Exploratory pilot, within-subject, paired comparison without Q vs with Q
Participant	One subject (Jon), one session
Device	Kinvent Physio dynamometer (ref. M124240), 500 Hz sampling
Movement	Shoulder abduction at 90°, seated
Task	Maximal voluntary isometric contraction against the strap — 3 trials/condition, best of 3 retained
Conditions	Without Q circuit, then with Q circuit (fixed order)
Primary outcomes	Peak force · left/right mean-force asymmetry

Summary

This pilot study compares one participant's shoulder abduction force, measured on a dynamometer, in two conditions — "without" then "with" a Q-Technology circuit. During maximal isometric contraction, peak force rose on both sides (+60% on the left, +46% on the right) and the asymmetry between the two shoulders dropped markedly (mean force: from a 19.4% gap to 2.1%). Force rose more gradually with Q (lower rate of force development, longer time to peak): the observed profile is "stronger, more sustained, more symmetrical" — not "more explosive." Exploratory result on a single subject, to be replicated.

1. Background and objective

Until now, Q-Technology's muscular observations rested mainly on manual testing: useful and reproducible in a clinical setting, but hand-graded, and therefore easy for a skeptic to dispute.

This study marks a step up in level of evidence: force is no longer estimated, it is measured in kilograms on a validated dynamometer. The objective is straightforward — to check whether a difference in force and symmetry is objectively measurable, instrument in hand, between the without-Q and with-Q conditions.

2. Method

Standardized protocol, instrument-read measurements:

- Participant: one subject (Jon), a single session.
- Device: Kinvent Physio dynamometer (ref. M124240), 500 Hz sampling rate.
- Movement: shoulder abduction at 90°, seated.
- Task: maximal voluntary isometric contraction (MVC) against the dynamometer strap.
- Repetitions: 3 per condition; the software automatically keeps the best of 3 (filters noise, confirms grip reproducibility).
- Conditions: without Q circuit (6:11 p.m.), then with Q circuit (6:23 p.m.) — fixed order.
- Measures: peak force (left, right), mean force, left/right asymmetry, rate of force development (RFD) and time to peak.

3. Results

Measure (Kinvent, best of 3)	Without Q	With Q	Reading
Peak force — left	13.2 kg	**21.1 kg**	+60%
Peak force — right	15.7 kg	**23.0 kg**	+46%
Peak-force asymmetry	16.0%	8.3%	halved (~2×)
Mean force — left / right	10.5 / 13.0 kg	18.3 / 17.9 kg	higher
Mean-force asymmetry	19.4%	**2.1%**	near-symmetrical
RFD (rise rate) — L / R	12.9 / 14.9 kg/s	4.77 / 10.6 kg/s	more gradual
Time to peak — L / R	1.7 / 5.1 s	7.5 / 8.0 s	longer rise

On the best of three trials, peak force rose on both sides: +60% on the left (13.2 → 21.1 kg) and +46% on the right (15.7 → 23.0 kg) — percentages computed by the dynamometer software itself.

The clearest signal is symmetry: the mean-force gap between the two shoulders fell from 19.4% to 2.1%, a near-equalization. The two shoulders did not merely push harder — they pushed more evenly.

4. Interpretation

Not everything increases with Q, and saying so is essential to credibility. The rate of force development (RFD) drops (on the left, 12.9 → 4.77 kg/s) and time to peak lengthens (1.7 → 7.5 s).

Fair reading: without Q, the shoulder produces a fast peak then fades (especially the left, which tires after ~1.7 s); with Q, it rises more gradually toward a higher peak and holds it. The observed profile is therefore not “more explosive” — the trace would say otherwise — but “stronger, more sustained, more symmetrical.”

Note: RFD asymmetry increases with Q. Rise speed is not the strength here; peak force and symmetry are. The reduction in asymmetry echoes, this time in measured force, the normalization already observed on other markers.

5. Limitations

- n = 1, one session: a proof of principle, not generalizable as such.
- Fixed order (without then with): a warm-up effect cannot be ruled out — but a +60% gain far exceeds what warm-up would explain (one usually sees a slight decline on the second trial).
- A single movement (shoulder abduction): still to be confirmed on other muscle groups.
- Non-blinded condition: the participant knows the condition. To be corrected in the rest of the series.

6. Next steps

- Alternate the order (with / without / with) to rule out the warm-up effect.
- Extend to several subjects and several muscles, to test the repeatability of the dual signal (force increase + asymmetry reduction).
- Introduce a blinded condition with a sham circuit placed by a third party.
- Track two primary outcomes: peak force and mean-force asymmetry.

7. Conclusion

For a first instrumented test, the signal is clear and consistent: higher peak force and reduced asymmetry, measured on a dynamometer — not a subjective impression. This is the kind of data that speaks to a strength coach, a physiotherapist or a sports physician, provided the exact framing is kept: an exploratory pilot study, to be replicated, with no medical claim. The Kinvent series is set to grow (more subjects, more muscles, randomized order).

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Source: Kinvent Physio report (M124240, 500 Hz), shoulder abduction 90°, best of 3 trials. Unaudited internal data. Not a medical claim.