

BACKGROUND

- Whole eye transplantation (WET) requires preservation of ocular perfusion and minimization of ischemic injury during procurement.
- In the first successful WET, a bypass was created between the ophthalmic artery and superficial temporal artery (STA).
- This bypass strategy:
 - Preserved ocular perfusion during the final stages of procurement
 - Enabled allograft inset using a single large pedicle based on the external carotid artery
- Normative anatomical data on the ophthalmic artery and STA are currently limited.
- Study Aim:** Define normal size and length variability of the STA to assess reproducibility of this bypass technique for future WET.

METHODS

- Study Design: Retrospective computed tomography angiogram (CTA) review with cadaveric validation
- After IRB approval, head and neck CTAs were reviewed from May 2025.
- Excluded: carotid, craniofacial, or ocular pathology.
- STA length measured in Visage Imaging to a vessel diameter of 1 mm or until terminal extent.
- Cadaveric dissection: bilateral STA dissected free and measured length from the external carotid artery to 1 mm diameter.
- Collected age and sex.
- Reported mean $\pm$ standard deviation for STA length
- Group means were then compared via independent t-test

METHODS

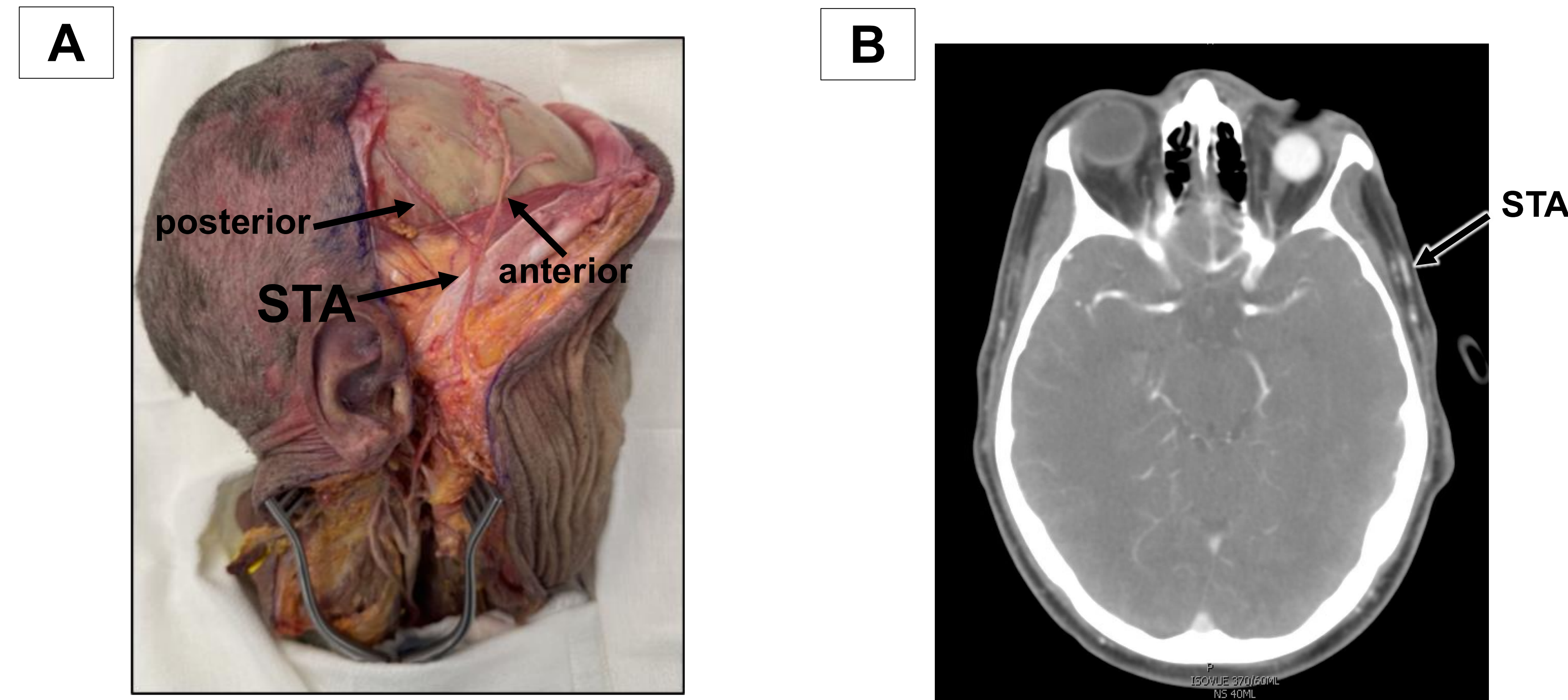


Figure 1. Anterior and posterior branches of the superficial temporal artery dissected on a cadaveric specimen (A) and representative computed tomography angiogram slice showing left STA (B).

RESULTS

- Total cohort:** 59 individuals
- CTA cohort:** 47 patients
- Cadaveric cohort:** 12 specimens
- Mean age:** 42 ± 14.6 years
- Sex:** 51% male
- Average STA length:**
 - CTA cohort:** 13.3 ± 3.7 cm
 - Cadaveric cohort:** 10.6 ± 3.1 cm
 - Overall cohort:** 12.0 ± 3.73 cm
- In the CTA cohort, all STAs had an internal diameter >1 mm at the end of visualized vessel length.
- Cadaveric cohort had significantly shorter measured STA lengths compared to CTA cohort

RESULTS

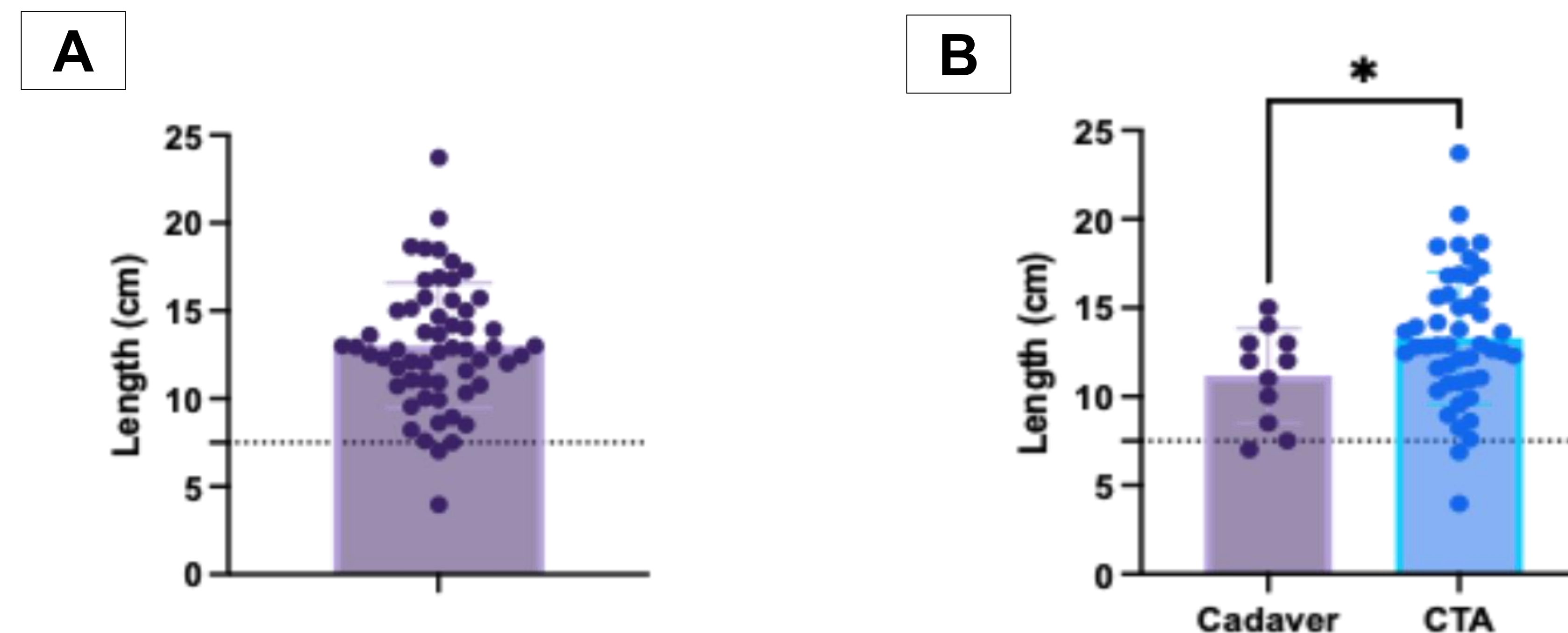


Figure 2. Total cohort STA lengths (A) and Cadaveric and angiographic imaging subgroup STA lengths (B). Dotted line on both graphs represent adequate length to reach lateral orbit.

* = significant difference in length

CONCLUSION

- The STA in the general population is a reliable candidate with adequate length for a bypass pedicle in WET
- Cadaveric STA measurements were slightly shorter than radiographic measurements but remained adequate in all cases
- This technique may provide continuous perfusion from the external carotid system during allograft procurement
- May also facilitate easier microsurgical anastomosis during transplantation.