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Scientific Formal (Paper) Presentations

CODE: SST09-01

SESSION: SST09

Vascular Communications between Donor and Recipient Tissues One Year after Successful Full Face Transplantation

Date/Times

- **DATE: Friday**
- **TIME: 10:30-10:40 AM**
- **LOCATION: N226**

PARTICIPANTS

- Kanako K Kumamaru MD, PhD - Nothing to disclose.
- Geoffroy C Sisk undefined - Nothing to disclose.
- Michael L Steigner MD - Speaker, Toshiba Corporation.
- Elizabeth George MBBS - Nothing to disclose.
- Bohdan Pomahac MD - Nothing to disclose.
- Frank J Rybicki MD, PhD - Research Grant, Toshiba Corporation Research Grant, Bracco Group.
- Kurt Schultz RT - Employee, Toshiba Corporation.
- Dimitris Mitsouras PhD - Nothing to disclose.
- David S Enterline MD - Consultant, Bracco Group Speakers Bureau, Bracco Group Consultant, General Electric Company Research support, Siemens AG Research support, Koninklijke Philips Electronics NV.
- Ericka M Bueno PhD - Nothing to disclose.

SUBSPECIALTY CONTENT

- Neuroradiology

PURPOSE

To noninvasively study vascular changes that have implications on graft survival and rejection, future surgical planning, and our understanding of the underlying biology changes after full face transplantation.

METHOD AND MATERIALS

Three full face transplant patients (single anastomosis bilaterally of artery and vein) for whom clinical findings were previously reported (NEJM 2012; 366:715-22) were, for the first time, evaluated for vascular reorganization 1 year after successful transplantation using a previously described 320 x 0.5 mm detector row dynamic CT angiography protocol (AJNR 2012, Aug 9, PMID 22878008).

RESULTS

Consistent, extensive vascular re-organization was observed among the recipients. Diverted external carotid artery (ECA) or facial artery angiosomes were found to be perfused from newly opened, elaborate collateral circulation. Using the metric of arterial blood flow (BF) at the temporal region expressed as the percentage of the BF at the internal carotid artery, allograft tissue was slightly less perfused when the facial artery was the only donor artery when compared to an ECA-ECA anastomosis ($4.4\pm0.4\%$ vs $5.7\pm0.7\%$). However, allograft BF was higher than the recipient normal neck soft tissue. Blood flow to the recipient's tongue was maintained, despite the fact that the recipient lingual arteries were not always preserved. On the side where the lingual artery was ligated, blood flow was redistributed from a contralateral artery. Venous drainage was adequate for all patients, including patients for whom the recipient internal jugular vein was anastomosed in end-to-end fashion on one side.

CONCLUSION

Despite extensive surface contact between the donor and the recipient, disruption of recipient's blood supply depends on extensive collateralization rather than new vessel ingrowth from the donor tissues. These findings guide both surgical planning and the assessment of potential complications for larger scale face transplant studies.

CLINICAL RELEVANCE/APPLICATION

A single anastomosis bilaterally of artery and vein is adequate for full face transplantation, evidenced by substantial arterial flow demonstrated on dynamic CT angiography.