QS10
Comparing Reconstructive Outcomes in Patients with Gustillo Type IIIB Fractures and Concomitant Arterial Injuries
Joseph A. Ricci, MD, John T. Stranix, MD, Z-Hye Lee, MD, Adam Jacoby, MD, Lavinia Anzai, MD, Vishal Thanik, MD, Pierre Saadeh, MD, Jamie P. Levine, MD
New York University, New York, NY, USA

PURPOSE: Despite advances in microsurgery, higher complication rates have persisted among lower extremity free tissue transfers. Historically, the Gustillo Classification has been utilized as a proxy for injury severity, but recent studies have shown that the rate of complications, notably flap failure, directly increase as arterial runoff decreases. When injured arteries are identified in patients requiring lower extremity free tissue transfer, a wide array of treatment options are possible: end-to-end or end-to-side anastomosis can be performed on either the injured vessel in question or on uninjured adjacent vessels. This study aims to compare the outcomes of these different treatment methods based on the number of injured vessels identified.

METHODS: A retrospective review of 806 lower extremity free flaps from 1976 - 2016 at a single center was performed. 409 patients were identified to have Gustillo Type IIIB fractures. Of these, 331 underwent preoperative angiography and patients were grouped based on the 3-2-1 classification, which identified the number of patent vessels in the leg: 1, 2 or 3 vessel runoff. Within each group, patients were compared based on the type of microvascular anastomosis performed (end-to-end or end-to-side) and whether the anastomosis was made to an uninjured or injured vessel. Primary outcome measures were perioperative flap complications and failures.

RESULTS: Overall, muscle flaps predominated (75%) over fasciocutaneous (25%) and major perioperative complications occurred in 111 flaps (27%): 71 takebacks (17%); 45 partial losses (11%); 37 complete losses (9%). Time to coverage was <10 days in 33%, 11–90 days in 35%, and >90 days in 32% of patients. Decreasing arterial runoff directly correlated with increased complications (p=0.048): compared to 3-vessel legs, 2-vessel had increased flap failures (RR=2.08, p=0.041), and 1-vessel had even higher failure risk (RR=3.67, p=0.001). There were 224 patients with 3-vessel runoff: 96 had end-to-end anastomosis and 128 with end-to-side anastomosis. An increased number of overall complications was noted in the end-to-side group compared to the end-to-end group (34% vs. 19%, p<0.01), but there was no difference in takebacks, flap loss or flap salvage rates. There were 68 patients identified with 2-vessel runoff in the leg: 23 with end-to-end into an injured vessel, 3 end-to-end into an uninjured vessel, and 42 end-to-side into an uninjured vessel. No difference between the groups was noted in terms of takebacks, flap loss or flap salvage rates, although vein grafts were required more often in the end-to-side groups (p <0.01). There were 39 patients identified with 1-vessel runoff in the leg: 22 had end-to-end anastomosis into an injured vessel and 17 with end-to-side anastomosis into an uninjured vessel. No difference between the groups was noted in terms of takebacks, flap loss or flap salvage rates, with a non-statistically significant trend toward more complications in the end-to-end group.

CONCLUSION: Lower extremity trauma reconstruction remains challenging and should be tailored to each individual patient. While the number of patent arteries does impact outcomes in lower extremity reconstruction, within each group, no superior microvascular anastomosis technique was identified: end-to-end vs. end-to-side and injured vs. uninjured vessel.

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QS11
Stem Cell Therapy Enriched Fat Graft Reconstruction of Craniofacial Deficits
Debra A. Bourne, MD1, Francesco M. Egro, MD, MSc, MRCS1, Jacqueline Bliley, MS2, Isaac James, MD1, Gretchen L. Haas, PhD1, E Michael Meyer, PhD3, Vera Donnenberg, PhD4, Albert Donnenberg, PhD4, Barton Branstetter, MD1, Kacey Marra, PhD5, Sydney Coleman, MD6, J Peter Rubin, MD1

1University of Pittsburgh Medical Center, Pittsburgh, PA, USA, 2Carnegie Mellon University, Pittsburgh, PA, USA, 3University of Pittsburgh Medical