Microscope-integrated Optical Coherence Tomography Accurately Predicts Anastomotic Patency

Presenter: Jared A Blau, MD, MEd

Co-Authors: Andrew Atia, MD, William Raynor, BS, Cynthia Toth, MD, Joseph Izatt, PhD, Anthony N Kuo, MD, Brett T Phillips, MD, MBA

Affiliation: Duke School of Medicine, Durham, NC

Background: Optical Coherence Tomography (OCT) uses low-coherence, long-wavelength light to penetrate different media and acquire high-resolution, cross-sectional images. Utilized widely in ophthalmology, OCT has yet to be routinely employed by plastic surgeons. We hypothesized that a microscope-integrated OCT platform could be used to scan through microvascular anastomoses and assess for vessel patency.

Methods: Twenty anastomoses were created using 3mm synthetic vessels (10 patent anastomoses and 10 intentionally flawed anastomoses). The flawed anastomoses were created by deliberately suturing a 1mm-x-1mm piece of synthetic vessel within the lumen. The anastomoses were performed with 8-0 nylon suture using an operative microscope (6 interrupted sutures per anastomosis). The 20 anastomoses were then individually rated by 3 blinded reviewers as “patent” or “flawed,” first by visual examination, then by OCT.

Results: For patent vessels, visual examination yielded a 33.33% accuracy (+/- 48.04 SD). When OCT scans were used, accuracy increased to 93.33% (+/- 25.38 SD). For flawed vessels, visual examination yielded a 25.93% accuracy (+/- 44.67 SD). When using OCT scans, accuracy increased to 90.00% (+/- 30.51 SD). Between imaging modalities (visual versus OCT), the difference in accuracy was statistically significant (p<.001). The inter-rater reliability was 0.76.

Conclusions: This study demonstrates that OCT is effective in predicting vessel patency in an in-vitro model. This technology can potentially be adopted in microsurgery to improve clinical outcomes by allowing visualization of anastomoses performed in the operating room.

Evaluating the Impact of Breast and Nipple Sensation on Quality-of-Life after Nipple-sparing Mastectomy with Implant Reconstruction: Long-term Outcomes Utilizing Breast-Q

Presenter: Nicole R Van Spronsen, MD

Co-Authors: Jacob B Hammond, MD, Lyndsay A Kandi, BS, Valerie L Armstrong, MD, Heidi E Kosiorek, MS, Alanna M Rebecca, MD, MBA, William J Casey, MD, Erwin A Kruger, MD, Patricia A Cronin, MD, Barbara A Pockaj, MD, Chad M Teven, MD

Affiliation: Mayo Clinic, Phoenix, AZ

Background: The effect of postoperative sensation on quality-of-life (QoL) following nipple-sparing mastectomy (NSM) with implant-based reconstruction is not well-described. We evaluated the impact of breast and nipple sensation on QoL using BREAST-Q.

Methods: Patients undergoing NSM with implant reconstruction from 2008-2020 were mailed a survey to characterize their postoperative sensation. BREAST-Q metrics were compared between totally numb patients and those with sensation.

Results: A total of 349 patients were included. Overall, 131 (38%) responded; response rates regarding breast and nipple sensation were 36% (N=124/349) and 34% (N=117/349). Median time from surgery to survey completion was 6 years. The majority had bilateral procedures (101, 77%), including direct-to-implant (99, 76%) and tissue expander (32, 24%) reconstruction. Regarding breast sensation (Table 1), the majority of patients reported their reconstructed breasts as totally numb (47, 38%) or much less sensation than before surgery (59, 48%). Regarding nipple sensation, the majority of patients reported their nipples were totally numb (67, 57%) or much less sensation than before surgery (37, 32%). Total numbness of reconstructed breasts resulted in a significantly lower chest physical well-being (Mean Score 73.5 vs. 81.2 respectively, P=0.048, Table 2). Total numbness of postoperative nipple(s) resulted in significantly lower chest physical well-being (Mean Score 73.5 vs. 81.2 respectively, P=0.048, Table 2). Total numbness of postoperative nipple(s) resulted in significantly lower chest physical well-being (Mean Score 73.5 vs. 81.2 respectively, P=0.048, Table 2).