rather than POD 2. Both patient groups were injected with LB and compared to historic controls. We examined LOS and patient satisfaction as primary outcomes within these populations.

RESULTS: Patients undergoing implant-based reconstruction, subjected to the new protocol, demonstrated a decreased length of stay. Utilizing standardized surveys, improvements in pain control were demonstrated with a percentile ranking change from 88th to 99th percentile, pain management summary score improvement from 62nd to 99th percentile, and improvement in pain control ranking from 27th to 99th percentile.

CONCLUSION: This study demonstrates patients undergoing implant and autologous-based breast reconstruction, who receive regional block with LB, use significantly fewer narcotics with decreased LOS and improved satisfaction.

28. NOVEL ORAL ANTICOAGULANTS (NOACS) IN MICROSURGERY: A REVIEW

Amy Yao, BS¹, Stav Brown, BS², Peter J. Taub, M.D.¹

¹Icahn School of Medicine at Mount Sinai, New York, NY, USA, ²Sackler School of Medicine, Tel Aviv University, New York, NY, USA.

PURPOSE: Thrombosis of the vascular anastomosis or distal flap microcirculation is the most common cause of microvascular free tissue transfer failure. The large volume of existing literature has not yet reached a consensus on the ideal anticoagulation regimen to prevent thrombosis following microsurgery. Dabigatran, rivaroxaban, and apixaban are novel oral anticoagulants (NOACs) with an efficacy and safety profile equivalent or superior to standard agents such as warfarin. However, published reports of the use of NOACs in microsurgery are limited. This review aims to summarize current knowledge regarding the use of NOACs in microsurgery and provide clinical recommendations based on each agent’s pharmacodynamics.

METHODS: A systematic literature review was performed using the PubMed, Cochrane, and Google Scholar databases. Inclusion criteria were case reports and series of the use of NOACs in microsurgery.

RESULTS: Five articles describing the use of NOACs in microsurgery were fully reviewed. A total of 32 patients undergoing 46 microsurgical procedures with either dabigatran or rivaroxaban were studied, with adverse effects occurring in 3 (6.5%). The most common adverse effect was hemorrhage, two of which were mild cases. No articles describing the use of apixaban were found. The risk of bleeding increased with concurrent administration of NSAIDs or other anticoagulants.

CONCLUSION: Preoperative administration of NOACs in microsurgery is safe and has a low side-effect profile compared to standard anticoagulants. However, current administration protocols remain varied. Further research is warranted to elucidate the risks and benefits of NOACs in microsurgery, and to establish management guidelines for improved microsurgical outcomes.

29. TO OPERATE OR NOT?: SURGICAL DECISION-MAKING CONCERNING THE SPECTRUM OF ORBITOFRONTAL DEFORMITY ASSOCIATED WITH METOPIC SUTURE CLOSURE

Min-Jeong Cho, M.D.¹, Rami R. Hallac, Ph.D.¹, Maleeh Effendi, B.S.², James R. Seaward, M.D.¹, Alex A. Kane, M.D.¹

¹University of Texas Southwestern Medical Center, Dallas, TX, USA, ²Texas Tech University Health Science Center School of Medicine, Lubbock, TX, USA.

PURPOSE: Metopic suture closure can manifest from benign metopic ridge, a benign variant of normal, to “true” metopic craniosynostosis (MCS), a severe trigonocephaly. Currently, there is no gold standard for how much associated orbitofrontal dysmorphology should trigger surgical intervention. In our study, we used a semi-automated three-dimensional (3D) curvature analysis to separate the phenotypes along the spectrum, and have employed it in conjunction with cluster analysis to compare surgeons’ thresholds for operation at one tertiary care craniofacial center.

METHODS: Retrospective chart review was performed identifying patients who presented with an early metopic
suture closure and underwent computed tomography (CT) or 3dM.D. scans in the interval 2010–2015. Curvature analysis were performed on these images using two user-defined regions of interest (mid-forehead and lateral orbit). K-means cluster analysis was performed to test the consistency of surgical intervention threshold among the different surgeons.

RESULTS: Three-dimensional curvature and cluster analyses were performed in 43 patients. The difference in average mean curvature between patients who underwent operation and conservative treatment was 11.3 m⁻¹ and -16.1 m⁻¹ for mid-forehead strip and right/left lateral orbit, respectively. The average mean curvatures of three regions of interest were significantly different (p<0.0001). In addition, K-means clustering classified patients into two different severity groups, and there was 96% agreement between the algorithm classification and surgeons’ decisions except two patients.

CONCLUSION: The described methods are effective in classifying severity and associated surgeon behavior, and offer the possibility for determining when surgical intervention may have been of questionable benefit.

30. SUCCESSFUL CONTROL OF VIRTUAL AND ROBOTIC HANDS USING NEUROPROSTHETIC SIGNALS FROM REGENERATIVE PERIPHERAL NERVE INTERFACES IN A HUMAN SUBJECT

Philip P. Vu, MS, Zachary T. Irwin, PhD, Ian C. Sando, M.D., Phillip T. Henning, M.D., Theodore A. Kung, M.D., Melanie G. Urbanchek, PhD., Cynthia A. Chestek, PhD, Paul S. Cederna, M.D.

University of Michigan, Ann Arbor, MI, USA.

PURPOSE: Regenerative Peripheral Nerve Interfaces (RPNIs) show promise in controlling neuroprosthetic devices. We have implanted and recorded from RPNIs in 3 subjects. Here, we present the results from our longest implanted subject with a distal transradial amputation.

METHODS: An RPNI consists of a muscle graft that is neurotized by the distal end of a transected peripheral nerve. Once revascularized and reinnervated, the RPNI muscle graft serves as a stable bioelectric amplifier for efferent nerve action potentials and produces recordable electromyography (EMG) signals. The subject was implanted with RPNIs on the residual median, ulnar, and dorsal radial nerves. Using ultrasound, RPNIs were located, and percutaneous fine-wire bipolar electrodes were inserted for acute EMG recordings. Temporal features of the EMG waveforms (100-500Hz) were used for decoding algorithms.

RESULTS: Eight months post-surgery, we recorded 300–400 μV EMG signals from the median RPNI with signal-to-noise ratio (SNR) of 24.2 and 100–120 μV EMG signal from the ulnar RPNI with SNR of 5.84. Additionally, EMG from residual muscles was obtained including the flexor digitorum superficialis with 100–120 μV signals, SNR of 6.30, and flexor pollicis longus with ~1mV signals, SNR of 47.8. With these signals, the subject controlled a virtual robotic hand in real time with 96% accuracy, choosing 1 of 4 movements within 212 trials. Importantly, the subject controlled a physical Touch Bionics iLimb neuroprosthetic hand with 100% accuracy, choosing 1 of 3 movements within 100 trials.

CONCLUSION: RPNIs harness neural signals from transected peripheral nerves with sufficient amplitude and fidelity to control an advanced neuroprosthetic limb.

31. EXTENSOR POLLICIS BREVIS SUBCOMPARTMENT CHARACTERISTICS IN THE 1ST DORSAL EXTENSOR COMPARTMENT: AN ANATOMIC AND RADIOGRAPHIC STUDY

Brittany J. Behar, M.D., Emma Dahmus, BS, Logan Carr, M.D., John Ingraham, M.D.

Penn State Hershey Medical Center, Hershey, PA, USA.

PURPOSE: We aim to characterize the 1st dorsal compartment anatomy and examine radiographic correlation with the presence of EPB subsheath.

METHODS: First, freshly-preserved cadaveric arms were dissected and data including the presence or absence of EPB