

METHODS: The authors conducted a review of all English language articles between 2009 and 2020 in PubMed, Embase, and Web of Science, reporting original outcomes on different methods of ILR in preventing secondary lymphedema, according to Preferred Reporting Items for Systematic Review and Meta-Analyses guidelines. Overall incidence timeline of lymphedema in patients postoperatively, postoperation complications, and surgical techniques were recorded and analyzed. We excluded non-ILR interventions, literature reviews/letters/commentsaries, and non-human or cadaver studies. Risk of bias was assessed. A total of 789 patients that were enrolled in 13 studies were included in our one-arm meta-analysis.

RESULTS: A total of 13 studies encompassing 789 patients met inclusion criteria: upper extremity ILR (n = 665) and lower extremity ILR (n = 124). Females accounted for 99.4% of the patients studied for upper extremity ILR, while men (69.4%) consisted mostly the lower extremity ILR cohort. The overall incidence of lymphedema for upper extremity ILR was 2.7% (95%CI: 1.1%–4.4%, P < 0.001), and lower extremity ILR was 3.6% (95%CI: 0.3%–10.1%, P < 0.001). For upper extremity ILR, the average follow-up time was 11.6 ± 7.8 months and the LE incidence appeared to be the highest around 1–2 years postoperation. ILR procedural time for upper extremity was 45.1 minutes (95% CI: 31.4–58.9 minutes) and lower extremity was 95.1 minutes (95% CI: 75.5–114.7 minutes). Higher incidence of postoperative complications was seen in lower extremity ILR patients (1.6%, 95% CI: 0.1%–4.8%, P < 0.001) than upper extremity ILR patients (0.9%, 95% CI: 0.1%–0.6%, P < 0.001), but neither significantly increased the risk of lymphedema (RR = 0.16, 95% CI: 0.01–4.26, P = 0.20). There was no correlation of lymphedema incidence rate with BMI (r = 0.115, P = 0.73), additional time added to a procedure (r = 0.159, P = 0.73), number of lymph nodes identified (r = –0.194, P = 0.54), and number of lymph nodes removed (r = 0.080, P = 0.80).

CONCLUSIONS: Lymphedema is a common complication in cancer treatment that needs to be taken seriously. Immediate Lymphatic Reconstruction is an effective technique to restore lymphatic drainage at the time of the index procedure for both upper and lower extremities and will decrease the incidence of lymphedema. Plastic surgeons who perform axillary lymphadenectomy for breast cancer or inguinal lymphadenectomy for malignant melanoma or for vulvar cancer may increase a patient’s risk of lymphedema postoperation and should consider ILR to reduce this risk.

The Development of a Virtual Sub-internship in Plastic Surgery during the COVID-19 Pandemic

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INTRODUCTION: The COVID-19 pandemic forced many institutions to modify their educational practices and experiences, including halting visiting rotations for senior medical students. These rotations provide opportunities for both programs and students to meet one another, and allow for students to gain clinical and didactic knowledge in a subspecialty field. A number of previous studies have shown that a large portion of medical students match at an institution at which they rotated.1–3 However, with social distancing and travel restrictions, outside medical students were unable to visit our institution. In light of this, our section felt it was necessary to develop a virtual curriculum to provide a similar experience. The aim of this study was to share our experience and feedback from students, residents, and faculty.

METHODS: The virtual rotation design mirrored that of our in-person rotation and included a mix of lectures, operative cases, case discussions, and social events. Students completed HIPAA training prior to the rotation, and specific consent was obtained from patients whose surgical cases would be live streamed for teaching. Feedback was obtained via prerotation and postrotation surveys on Qualtrics, as well as interviews with students, residents, and faculty.

RESULTS: Twelve students participated (3 rotations, 4 students each). The curriculum included approximately 19 hours of lecture, 29 hours of live operating room time, and 8 hours of informational, mentor, or social events. Eight students (75%) completed the pre-rotation survey, and five (42%) completed the post-rotation survey. Overall, visiting students enjoyed the virtual rotation and found it useful and informative. When asked if virtual rotations should be kept as an option next year, 60% answered “yes” and 40% responded “maybe.” Notably, students reported feeling like they knew more about the University of Chicago program after the rotation, and they answered an average of 3.20 and 3.37 points higher in the post survey to “On a scale from 1 to 10 how much do you feel like you know about the University of Chicago Program- Faculty” and “Residents,” respectively. Students reported that they enjoyed interacting with the team and the learning opportunities, but some noted that it was difficult to make an impression.
CONCLUSIONS: We developed a two-week virtual curriculum that provided medical students from across the country an opportunity to learn more about plastic and reconstructive surgery and about the University of Chicago program. As virtual learning is becoming an increasingly vital part of medical education, our experience provides important insights on how we can best structure these opportunities moving forward.

REFERENCES:
1. Drolet BC, Brower JP, Lifchez SD et al. Away rotations and matching in integrated plastic surgery: applicant and program director perspectives. *Plast Reconstr Surg*. 2016;137(4):1337–1343.
2. Janis JE, Hatef DA. Resident selection protocols in plastic surgery: a national survey of plastic surgery program directors. *Plast Reconstr Surg*. 2008;122(6):1929–1939.
3. Sergesketter AR, Glener A, Nguyen VT, et al. Abstract 9: The association between sub-internships and match rank order for integrated plastic surgery programs. *Plast Reconstr Surg Glob Open*. 2020;8(5S):5–6.

Traction Osteogenesis: A Novel Approach to Growing the Pruzansky 3 Mandible

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INTRODUCTION: Severe mandibular hypoplasia causes obstructive sleep apnea (OSA). The Pruzansky III mandible has a diminutive, misshapen ramus packed with primary dental follicles clustered about the inferior alveolar nerve. This precludes osteotomy for mandibular distraction without injury to teeth and nerve. In infants with severe OSA who are too young for reconstruction with rib graft or vascularized bone, tracheostomy is the only option.

METHODS: Patient 1 is a 16-month-old girl with oculo-auriculo-vertebral phenotype and severe OSA (OAHI = 39.6, O2 nadir = 73%) with Pruzansky I mandible on the left and Pruzansky III mandible on the right. Virtual surgery was used for operative planning. On the left, an inverted-L osteotomy was combined with internal distraction. On the right (Pruzansky III), an osteotomy was made just below the dental sacs and an internal distractor transported this segment in the appropriate vector toward the skull base. Patient 2 is a 2.5-year-old girl with Treacher Collins with bilateral Pruzansky III mandible who underwent tracheostomy as an infant. Virtual surgery was used for planning and she underwent mandibular osteotomies around the molar tooth buds with planned sacrifice of the inferior alveolar nerve.

RESULTS: Patient 1: Following distractor activation (26 days, 22.6 mm Lt, 30 mm Rt), polysomnography confirmed resolution of OSA (OAHI = 1.7). CT was obtained two months into consolidation. On the left, there was expected bone growth from distraction osteogenesis. On the right, there was bone generation from distraction osteogenesis as well as significant growth of the non-mobilized portion of the mandible above the osteotomy. This growth was characterized by migration of the dental sacs in the vector of traction applied to them by the segment of distracted bone. Distractors were removed after 3 months of consolidation; the bone was confirmed to be of excellent quality.

Patient 2: Following distractor activation (33 days, 21 mm bilaterally), patient developed an infection at the L distractor site requiring incision and drainage in the operating room. CT scan was obtained 5 months into consolidation demonstrating good bone generation. Distractors were removed after 6 months of consolidation (extended due to infection) and the bone was confirmed to be of excellent quality. She is in the process of decannulation with planned polysomnography.

CONCLUSIONS: We describe a novel surgical option using “Traction Osteogenesis” to safely elongate the Pruzansky III mandible. Traction Osteogenesis uses an internal distractor to apply steady directional traction to dental sacs (the precursors of periodontic ligaments responsible for tooth movements). The biomechanical phenomena that follow are well-known to orthodontists and allow migration of dental sacs while recruiting and activating osteoblasts and other cell mediators of bone apposition. In Patient 1, tracheostomy was avoided and a Pruzansky III mandible was re-shapen into a Pruzansky II mandible, providing time and space for later rib graft or safe secondary distraction. In Patient 2, bilateral Pruzansky III mandible was also re-shapen into a Pruzansky II mandible. She has demonstrated improved oral feeding and is in the process of decannulation. Evaluation of longer-term osseous stability and growth are scheduled.

A Comparative Cohort Study of Management of Burn Injuries during the COVID-19 Pandemic and Patient Perspective of Video/Tele-clinics: A UK Regional Burn Centre’s Experience