patients. This study reports the first prophylactic LVB in melanoma patients undergoing complete LND for gross metastatic disease.

METHODS: We present a case series of 15 patients with malignant melanoma who had axillary or ilioinguinal LND for bulky regional involvement and who underwent prophylactic LVB. Details of the surgical procedure, common pitfalls, and indications are discussed.

Five milliliters of indocyanine green (ICG) dye is injected into the hand or foot web spaces. Meticulous complete LND is then started using loupe magnification, minimal cautery dissection, and sharp lymphatic and venous transection. During lymphadenectomy, the lymphatics are assessed using ICG lymphangiography and a fluorescent surgical microscope. Using the multispectrum platform with its rainbow color on-lay software, smaller lymphatic vessels are classified based on their signal intensity, with red indicating the highest intensity and blue the lowest. Those lymphatics that need to be transected and are red on the rainbow color on-lay scale are selected for anastomosis.

RESULTS: During this study period, 15 patients underwent lymphatic preservation surgery. Multiple subdermal ICG dye injections allowed for visualization of 1–3 transected lymphatics after LND. An average of 1.8 LVBs (range, 1–2) was performed per patient. All the anastomosis were patent as shown by ICG lymphangiography. End-to-end anastomosis was employed in 4 patients, and intussusception anastomosis was performed in 11 patients. LVB operative time varied from 40 to 150 minutes. Drain period ranged from 6 to 18 days.

CONCLUSIONS: Performing LVB in prophylactic setting with gross metastatic disease in melanoma patients distinguishes our study from others. In our study, using ICG angiography, we identified lymphatic vessels under up to 42× magnification, including those with high flow based on a gradient scale via rainbow color on-lay software system. Traditionally, isosulfan and methylene blue are used for lymphatic visualization. However, they have a risk of severe hypersensitivity reactions, isosulfan blue might interfere with oxygen saturation, and their use is associated with increased incidence of tissue necrosis. Using ICG eliminates these risks. In 2017, Multicenter Selective Lymphadenectomy Trial II showed no survival difference in patients with intermediate-thickness, node-positive melanoma who underwent immediate CLND. Thus, most patients undergoing lymphadenectomy currently have gross, many times bulky metastatic disease. Despite more extirpative surgery as compared to CLND for positive sentinel lymph node biopsy, we were still able to easily identify lymphatics and appropriate recipient veins in all our patients. Expensive and time-consuming radioactive tracer studies were not needed. This technique is reproducible as we have successfully completed this procedure in all 15 consecutive cases. Restoration of lymphatic flow following axillary or ilioinguinal LND in melanoma patients represents a new approach that may decrease the burden of iatrogenic extremity lymphedema.

Revision Surgery Following Gracilis Transplantation for Pediatric Facial Reanimation

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PURPOSE: Management of pediatric patients with facial paralysis is challenging, and numerous surgical techniques have been described for smile reconstruction. A free gracilis muscle transfer innervated by a cross-face nerve graft (CFNG) from the contralateral facial nerve or by the ipsilateral motor nerve to masseter (MNTM) is recognized as the gold standard for smile reconstruction owing to its reliable outcomes. Despite the ubiquity of this technique in the pediatric population, there are limited data regarding the rate of secondary surgery to improve the cosmesis, symmetry, or function of the reconstruction. The purpose of this study was to assess the occurrence and type of secondary surgical procedures following pediatric facial reanimation using gracilis muscle transplantation.

METHODS: Following ethics board approval, a retrospective cohort study was performed and included children who underwent facial reanimation using free gracilis muscle transfer at our pediatric hospital between 1985 and 2014. Medical charts were reviewed to assess secondary surgical procedures performed at least 1 year following the initial reanimation surgery. Procedures related to early postoperative complications, including hematoma or infection, were excluded. Indications for surgical revision were subdivided into major revisions—which involved a non- or poorly functioning muscle transplant necessitating a new gracilis muscle transplant—and minor revisions, where muscle function was acceptable, but surgery was intended to improve cosmesis and/or symmetry.

RESULTS: There were 261 cases of facial reanimation utilizing a free gracilis muscle transfer between 1985 and 2019. One hundred seventy-three unilateral (66%) and 88 bilateral (34%) reconstructions were performed. Fourteen patients, 7
male and 7 female, required surgical revision (5.4%). The mean time to revision was 2.5 years following the initial surgery. Among patients requiring revision, 10 had muscle transplants innervated by a CFNG, and 4 by the MNTM. There was no statistically significant difference in the rate of revision between CFNG and MNTM (7.7% versus 4.8%; \( P = 0.4 \)). Minor revisions to improve cosmesis and symmetry were performed in 12 patients (4.6%). Only 2 patients (0.8%) required major revisions, in which the gracilis muscle from the primary surgery was removed and replaced with a new free functioning gracilis muscle. There was no significant difference in revision rate for patients undergoing unilateral versus bilateral procedures (6.8% versus 3.5%; \( P = 0.4 \)).

CONCLUSIONS: Our study supports the use of gracilis muscle transplantation as a reliable technique for smile reconstruction in pediatric facial palsy, with low rates of secondary revision. Secondary surgery is most often performed to improve cosmesis and/or symmetry, and major revisions requiring microvascular transplantation of new muscle transfers are rare.

Economic Burden of Out-of-Pocket Spending for Plastic Surgery Procedures: Value From the Patient's Perspective

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PURPOSE: Health insurance reimbursement structure has evolved with patients becoming increasingly responsible for their healthcare costs through rising out-of-pocket (OOP) expenses. High levels of cost sharing can lead to delays in access to care, influence treatment decisions, and cause financial distress for patients.\(^1\)\(^2\) Given the possible negative effects of OOP expenses on the patient, we aim to investigate temporal trends in OOP expenses for plastic and reconstructive surgical procedures and determine drivers for increased cost sharing.

METHODS: The study cohort comprised of patients undergoing the most common outpatient reconstructive plastic surgeries (skin cancer excision with closure, breast reconstruction, breast reduction, hand surgery, facial fracture repair, and scar revision/complex closure),\(^1\) using Truven MarketScan databases from 2009 to 2017. Sociodemographic characteristics, insurance type, and outpatient surgery location data were collected. Total cost of the surgery paid to the insurer and OOP expenses, including deductible, copayment, and coinsurance, were examined over time. OOP expenses were investigated using multivariable generalized linear modeling with log link and gamma distribution. All costs were inflation adjusted to 2017 dollars.

RESULTS: We evaluated 3,181,125 outpatient plastic and reconstructive surgical procedures between 2009 and 2017. The adjusted mean total cost in 2009 was $1,055 and in 2017 was $1,338 (increase in 27%), and the adjusted mean OOP expenses in 2009 were $121 and in 2017 were $184 (increase in 52%). Patients undergoing hand surgical procedures had the largest increase in total cost ($1,776 in 2009 to $2,545 in 2017, increase of 43%, \( P < 0.001 \)) and OOP expenses ($197 in 2009 to $331 in 2017, increase of 68%, \( P < 0.001 \)). Procedures performed in ambulatory surgical centers accounted for the largest increase in cost sharing between 2009 and 2017 (increase of 74%), but total costs only increased 24%. Facility fees were $385 on average in 2009 compared to $704 in 2017 (\( P < 0.001 \)), and mean professional fees were $538 in 2009 compared to $635 in 2017 (\( P < 0.001 \)). In the adjusted regression, managed care, Medicare-managed care, and Medicare-fee-for-service had approximatively 42%–64% of the OOP expenses compared to fee-for-service insurance (\( P < 0.001 \)).

CONCLUSION: For outpatient plastic surgery procedures, OOP expenses are increasing at a faster rate than total costs. Wide variability in cost sharing was seen across the different plastic surgery procedures, surgical location, and insurance type. For outpatient plastic surgical care that is largely elective, these temporal trends in OOP expenses must be explored and should be incorporated in the decision-making process for surgery. Given the increased scrutiny placed on rising healthcare costs, policy makers should consider the impact of cost sharing and the financial burden placed on the patient when discussing value-based reimbursement reform.

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