and young adult patients with macromastia. However, little is known about the incidence, significance, or appropriate management of incidental abnormal breast pathology identified in pediatric patients. This study aims to characterize incidental pathologic findings of adolescent and young women undergoing reduction mammoplasty and guide management of young patients with incidental breast tissue abnormalities. Data were obtained from a retrospective chart review of 798 adolescent and young adult women who underwent unilateral or bilateral reduction mammoplasty at Boston Children’s Hospital between June 2010 and May 2018. Charts were reviewed for patient demographics, indication for surgery, relevant medical history, relevant family history, medications, breast cancer risk factors, type of surgery, reduction mammoplasty specimen weight, and histologic findings. Mean age at surgery was 17.5 years (range, 11–24 years). Indications for surgery included bilateral macromastia (94.9%), breast asymmetry (4.9%), and juvenile breast hypertrophy (0.3%). Patients (87.2%) had breast tissue without significant histopathologic change. Among the remaining 12.8%, findings included benign, nonproliferative lesions (e.g., fibrocystic change, ductal ectasia) in 7.4% and proliferative lesions without atypia (e.g., fibroadenoma, fibroadenomatoid change, pseudoangiomatous stromal hyperplasia) in 7.4%. Five patients (0.6%) had proliferative lesions associated with increased risk for invasive carcinoma, including 4 (0.5%) with atypical ductal hyperplasia and 1 (0.1%) with focal atypical hyperplasia. Patients with atypical proliferative lesions ranged from 14 to 19 years old, and none had a personal history of cancer, first-degree family history of breast cancer, or known history of BRCA mutation. Among all women who undergo reduction mammoplasty, prevalence of incidental overt carcinoma and high-risk proliferative lesions are low, with the largest study to date reporting 0.79% and 6.26%, respectively. Our findings are lower than those reported in older women, as expected. The low rate of overt breast carcinoma in young women has caused some to advocate against routine pathologic evaluation of reduction mammoplasty specimens. However, young women with atypia may have a greater risk of developing breast cancer relative to older women with atypia, and women who develop breast cancer before 35 years old tend to have more aggressive disease. The 5 young women with incidental atypical proliferative findings had no risk factors that would have otherwise stratified them for more rigorous breast cancer surveillance. Thus, the value of detecting incidental proliferative lesions in young women may lie in identifying those with an increased risk of developing invasive and/or biologically aggressive disease, facilitating earlier and more rigorous screening.

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Economics of Prepectoral Versus Subpectoral Implant-based Breast Reconstruction

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PURPOSE: Prepectoral breast reconstruction is increasingly prevalent due to numerous esthetic and patient-reported outcome benefits. However, the need for more mesh draws criticism regarding cost. There are limited studies comparing the economics of subpectoral versus prepectoral techniques. We aim to evaluate total patient cost differences between prepectoral and subpectoral breast reconstruction at our institution.

METHODS: We performed a retrospective review of patients undergoing immediate tissue expander-based reconstruction at our institution from 2016 to 2018. We excluded patients with <1-year follow-up, those who had concurrent gynecologic or nonreconstructive breast procedures, or those who did not receive postoperative antibiotics. In addition to clinical data, we recorded net patient charges for the initial surgery (reconstruction and mastectomy), implant exchange, and readmissions or reoperations for complications and revisions. Unilateral and bilateral cohorts were independently evaluated. Our primary outcome was the total charge for reconstruction (TCR).

RESULTS: There were 53 unilateral reconstructions (12 prepectoral and 41 subpectoral) and 69 bilateral reconstructions (16 prepectoral and 53 subpectoral). There were no significant demographic or treatment differences in terms of age, body mass index, smoking history, or chemotherapy and radiation exposure. Average follow-up was 25 months and 21 months for the prepectoral and subpectoral groups respectively. Among unilateral reconstructions, the TCR at follow-up was $194,000 for the prepectoral cohort and $168,000 for the subpectoral cohort (P = 0.07). The average cost of initial operation was $17,000 more for the prepectoral group (P < 0.01), and the average cost of implant exchange was $6,000
more in the subpectoral group ($P = 0.03$). There were no differences in cost for complications, readmissions, or revisions between cohorts. Six (50%) prepectoral patients and nine (22%) subpectoral patients had ≥1 reoperation ($P = 0.06$). Four (33%) prepectoral patients and nine (22%) subpectoral patients had ≥1 readmission ($P = 0.42$). Among bilateral reconstructions, the TCR at follow-up was $240,000$ for the prepectoral cohort and $220,000$ for the subpectoral cohort ($P = 0.19$). The average cost of initial operation was $27,000$ more for the prepectoral group ($P < 0.01$), and the average cost of implant exchange was $11,000$ more in the subpectoral group ($P = 0.01$). There were no differences in costs for complications, readmissions, or revisions between cohorts. Ten (63%) prepectoral patients and 31 (58%) subpectoral patients had ≥1 reoperation ($P = 0.78$). Two (13%) prepectoral patients and 17 (32%) subpectoral patients had ≥1 readmission ($P = 0.12$). Subpectoral patients trended toward more admissions for pain control following any surgical procedure at 25% versus 6% ($P = 0.11$).

CONCLUSIONS: The costs associated with prepectoral breast reconstruction were not statistically different from subpectoral breast reconstruction at our institution in patients with ≥1-year follow-up. Although trends toward higher costs of total reconstruction were seen in the prepectoral group, these are likely offset by quality of life measures, less invasive nature, and decreased long-term revisions for animation deformity and capsular contracture that have not yet been measured. Longer follow-up may allow a more detailed assessment of any difference in overall cost between these 2 techniques.

Safety of Retrograde Flow of Internal Mammary Vein: A Cadaveric Study and an Anatomical Evidence

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**Purpose:** Internal mammary artery and internal mammary vein (IMV) are one of the most widely used recipient vessels for performing the free autologous tissue-based breast reconstruction. In some cases, however, additional vessels may be required to handle multiple flaps for volume addition, to boost a blood flow for supercharging purposes, or to use the other vessels when an anterograde flow of IMV is obstructed. In these situations, the opposite direction of the internal mammary vessel can be used as a retrograde flow. However, there are doubts and concerns about the safety of using this flow.

**Methods and Materials:** Forty sides of the chest from 20 fresh cadavers with intact thoracic cage and IMV were used for the study. The numbers and location of the IMV valves were checked, and the location of starting vein bifurcation was also confirmed. Infusion of indocyanine green in the retrograde direction was followed by fluorescent angiography to confirm the direction of flow. Additional flow using saline infusion was checked to verify the flow in the opposite vein over the sternum.

**Results:** Twenty-eight valves were identified in 40 sides of the chest, and an average of 0.7 valves per each side of the chest was identified. Twenty-three (82.1%) valves out of 28 were located above the second intercostal space (ICS). The bifurcation the IMV most commonly occurred at third ICS (18/41, 43.9%), followed by second (9/41, 22%), fourth (8/41, 19.5%), and first (4/41, 9.8%) ICS. The average number of communicating veins between the 2 veins after branching was 1.76 numbers. Indocyanine green fluorescent angiography proved that the retrograde flow was shown to the caudal direction through the bypass. A large amount of the retrograde flow was drained to each level of the intercostal veins and the opposite IMV cross over the caudal border of the sternum around the xiphoid.

**Conclusion:** IMV valves are located concentrically above second costal cartilage level even though 0.7 IMV valves of each side of the chests were confirmed. Based on these results, it is highly unlikely the retrograde flow to be disturbed by the valve because the level of the retrograde anastomosis would be used below the second ICS. Furthermore, vein starts to make the bifurcation below the second or third ICS which having the 1.76 average number of communicating veins. It will allow keeping the flow if the valve interferes. The bypass flows into the intercostal vein, and the sternal vein through crossing the xiphoid is also possible. In conclusion, IMV retrograde flow is considered safe.

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Oncologic Safety and Surveillance of Autologous Fat Grafting Following Breast Conservation Therapy: A Matched Control Study

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