METHODS: After institutional review board approval, a retrospective chart review was conducted of a consecutive series of patients at a single institution undergoing ventral hernia repair with minimally invasive CST between 2015 and 2019 performed by the senior author (LKV). Following ventral hernia exposure by general surgery, a modified minimally invasive CS through bilateral 4–5 cm subcostal incisions was performed. After sub external oblique aponeurosis (EOA) tunneling using a 10-mm Covidien balloon dissector through a 2 cm EOA incision, the external/internal oblique space was expanded with balloon inflation. Under direct vision the subcutaneous layer was released above the external oblique fascia using electrocautery. The EOA was divided from above the costal margin to a point above the inguinal ligament. Underlay mesh followed by skin closure was performed by the general surgeon. Patient characteristics and outcomes were analyzed. Descriptive data are presented as means when continuous or as total sample (percentage) when categorical.

RESULTS: In total, 10 patients were identified who met inclusion criteria. A total of 20 modified CST procedures were performed. We could not determine from the chart review, the hernia width in two patients; however, the mean hernia size was 9.5 cm for 8 patients. Hernia site occurrences showed two hernia recurrences, and three surgical site infections (two superficial and one deep). CS site occurrences were 1 superficial infection at the incision site.

DISCUSSION: This procedure differs from other reported minimally invasive procedures because it releases the skin attachment over the external oblique while preserving the central abdominal perforators, which may allow for greater soft tissue mobilization to the midline. This procedure is efficient, with average operative time of 15 minutes per side by the senior author (LKV) and minimal risk at the CS site.

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Dog Bytes: Data on Canine-inflicted Pediatric Injuries

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BACKGROUND: Although single institution studies have analyzed various animal attacks, there has not been multi-center investigation into dog bites in children. The purpose of this study was to compile the largest reported database of pediatric dog bites and investigate the characteristics of resulting injuries across various periods of childhood.

METHODS: Retrospective cohort study was conducted of pediatric dog bite injuries in the United States from 2010 through 2020 using the PHIS database. Patient characteristics, injury locations, and need for intervention were analyzed with appropriate statistics.

RESULTS: During the study interval, 56,106 pediatric patients presented for treatment of dog bites. Median age was 6.8 years (95%CI 6.8–6.9), and the majority were men (55.1%, n = 30924). Dog bites demonstrated a cyclic incidence with peaks occurring in July (median 1217) and nadirs occurring in February (median 760). There has been a substantial increase in dog bites per overall ED presentations during the COVID-19 pandemic. Before the pandemic, dog bites averaged 0.33% of ED visits, whereas since the beginning of the pandemic, dog bites have nearly tripled, representing 0.80% of ED visits.

Most common location for dog bites in pediatric patients overall was the head (62.1%, n = 34835), followed by the upper extremity (25.1%, n = 14086). The majority of toddlers had facial injuries (age < 3 years: 82.5%, n = 9584), whereas the majority of teenagers had upper extremity injuries (age 13 years+: 40.9%, n = 2958). The relative proportions of dog bites to the face gradually decreased with age (P<0.001, B = –3.4% per year), whereas relative proportions
of dog bites to the upper extremities ($P < 0.001, B = +1.9\%$ per year) and lower extremities ($P = 0.002, B = +1.6\%$ per year) gradually increased as patients became older.

Overall, 8.0\% (n = 4515) patients required operative intervention, and dog bites to various portions of the body had different risk of requiring surgery. Dog bites isolated to the head ($P < 0.001, OR = 2.6, 95\% CI 2.4–2.9$) were significantly more likely to require operative intervention, whereas isolated dog bites to the torso ($P < 0.001, OR = 0.5, 95\% CI 0.4–0.6$), upper extremity ($P < 0.001, OR = 0.4, 95\% CI 0.4–0.5$), and lower extremity ($P < 0.001, OR = 0.3, 95\% CI 0.3–0.5$) were significantly less likely to require operative intervention. Patients with dog bites to multiple anatomic regions were more likely to require operative intervention ($P < 0.001, OR = 2.6, 95\% CI 2.4–2.8$).

Median hospital billed charges after dog bites was $1933, and patients who required operative intervention were billed significantly more ($P < 0.001, $26,080 versus $1761$). Pediatric dog bites to multiple anatomic locations had significantly higher admission charges ($P < 0.001, $3005 versus $1886$). Among dog bites isolated to one anatomic location, dog bites to the head were billed the most (median $2098$), while dog bites to the torso were billed the least (median $1390$).

**CONCLUSIONS:** Quarantine circumstances have kept children at home longer, while parents are working from home and concurrently tasked with around-the-clock child supervision. These influences may have contributed to pediatric dog bites significantly increasing during the COVID-19 pandemic. Further research will be focused on elucidating the socioeconomic and demographic factors associated with pediatric dog bite injuries as families differentially cope with these novel challenges.

Cost-utility Analysis of Surgical Treatments for Breast Cancer-related Lymphedema

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**PURPOSE:** Breast cancer-related lymphedema (BCRL) is a chronic and debilitating complication of breast cancer treatment affecting over one-third of breast cancer patients.\(^1\) BCRL is associated with significant physical, psychological, and financial burden, which can negatively impact a patient’s quality of life.\(^1,2\) Traditional management of BCRL is complete decongestive therapy, a collection of lifelong interventions that can be time-consuming, labor-intensive, and expensive.\(^3\) Surgical interventions for BCRL such as lymphaticovenular bypass (LVB) and vascularized lymph node transfer (VLNT) have been increasingly investigated as effective alternatives to decongestive therapy.\(^4\) In this study, we conducted a cost-utility analysis to compare the costs and quality-of-life measures for patients undergoing surgical lymphedema treatments.

**METHODS:** This is a single-center, retrospective study. We identified adult women undergoing surgical BCRL treatment with LVB and VLNT at Cleveland Clinic Foundation between 2016 and 2020. Patient-reported outcomes data were obtained through preoperative and postoperative Patient-Reported Outcomes Measurement Information System surveys. We utilized institutional reimbursement rates to calculate procedural costs. Average utility scores were obtained and converted to quality-adjusted life years. A decision tree with rollback analysis to identify the most cost-effective decision was generated. Negative outcomes in both treatment arms included costs of conservative treatment. An incremental cost-utility ratio was subsequently calculated. Sensitivity analyses were conducted to evaluate our findings.

**RESULTS:** The study included 6 women undergoing LVB and 4 women undergoing VLNT. The average age was 58 years (SD = 8). Average time between lymphedema diagnosis and surgical intervention was 7 years (SD = 7). The calculated quality-adjusted life years for LVB and VLNT were 17.70 life years and 17.00 life years, respectively. The estimated cost for LVB was $31,859, while the estimated cost for VLNT was $39,137. The calculated incremental cost-utility ratio of LVB to VLNT was $-10,397. Rollback analysis identified LVB as the more cost-effective strategy.

**CONCLUSIONS:** This study provides insight to the comparative effectiveness of LVB and VLNT as treatments for BCRL. We demonstrated that LVB is a more cost-effective treatment option for BCRL than for VLNT. Regardless of treatment modality, lymphedema incurs significant financial burden for patients, underscoring the need for policy-driven change to decrease lymphedema costs. Further investigation is necessary to examine targeted management as well as prevention strategies for BCRL. Larger studies