adverse events were defined a priori and classified using the Clavien-Dindo scale. Surgeon volume was defined as the mean number of MIH cases performed per month by each surgeon during the study period.
RESULTS: Seven hundred sixty-three patients met inclusion criteria: 416 (54.5%) TLH, 196 (25.7%) RH, 90 (11.8%) TVH, and 61 (8%) LAVH. Mean (±SD) age was 47 ± 6 years, and body mass index (BMI) was 31.1 ± 7.4 kg/m^2. Sixty-six surgeons performed MIH for uteri >250 grams during the study period. The mean monthly case volume was 16.4 ± 7.2 cases, and the median MIH volume was 23 cases (range: 1−147 cases). The mean uterine weight was 522.8 ± 322.7 grams. The rate of postoperative adverse events >Dindo grade 2 was 17.8% (95% CI = 15.2-20.7); 2.2% (95% CI = 1.4-3.6) were grade 3 and 0.5% (95% CI = 0.7-1.4) grade 4; there were no grade 5 adverse events. The overall rate of intraoperative adverse events was 4.2% (95% CI = 2.9-5.9). The rate of conversion to laparotomy was 5.5% (95% CI = 4.0-7.4). There was no difference in adverse event rates between the routes of MIH cases (25.6% vs. 17.5% vs. 18.0% vs. 14.8%, p = 0.2). Women who experienced any adverse event compared to those who did not were more likely to be of Hispanic, Asian or "other" ethnicity, had higher intraoperative blood loss (EBL) and longer operating case time. In a logistic regression model controlling for age, BMI, uterine weight, operating time, history of laparotomy and parity, higher monthly MIH volume remained significantly associated with adverse events (adjOR = 1.14, 95% CI = 1.0-1.3, p = 0.01), as did higher EBL (adjOR = 1.4, 95% CI = 1.1-1.8, p = 0.006). When controlling for the same variables, higher monthly MIH case volume remained significantly associated with intraoperative complications (adjOR = 1.30, 95% CI = 1.0-1.6, p = 0.02) as well as higher EBL (adjOR = 3.1, 95% CI = 2.0-4.9, p < 0.001). Conversion from a minimally invasive approach to laparotomy was not associated with monthly MIH case volume; however, conversion was associated with higher EBL (adjOR = 2.9, 95% CI = 1.8-4.9) and heavier uteri (adjOR = 9.7, 95% CI = 3.9-23).
CONCLUSION: The overall rate of serious adverse events associated with MIH for uteri >250 grams was low. Higher EBL and longer operative times were associated with higher perioperative adverse event rates. Higher monthly MIH case volume was associated with a higher rate of intra- and postoperative adverse events but was not associated with conversion to laparotomy.

DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS: C. E. Bretschneider: Nothing to disclose; Pamela Frazzini Padilla: Nothing to disclose; Deepanjana Das: Nothing to disclose; J Eric Jelovsek: Nothing to disclose; Cecile Unger: Nothing to disclose.

13 The role of additive manufacturing (3-D printing) in developing an oasis repair model

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OBJECTIVES: To describe our experience developing a training model for simulation of episiotomy and OASIS repair using additive manufacturing.
MATERIALS AND METHODS: The rate of third and fourth degree perineal lacerations has decreased, translating to fewer opportunities to practice repairs. Additive manufacturing can enhance training by providing realistic and affordable models. Use of this technology within the field of OBGYN has not been well documented. Commercially available OASIS repair models are costly, and cost-effective models using animal tissues are burdensome. Given the lack of training opportunities, affordable and realistic models are needed. Our simulation model originated from 3-D reconstruction of radiology scans. Digitalized modeling was used to alter files to obtain proper anatomy. Additive manufacturing was used to create tools for silicone molding to produce skin, muscle, and mucosal layers of the perineal body to realistically create a detailed representation of the anal sphincter complex that also incorporated the bulbocavernosus and superficial transverse perineal musculature, not simulated in commercially available models. The 3-D printed parts, silicone, and hardware supplies were used to create a final model.
CONCLUSION: We developed an affordable and easily reproducible 3-D perineal model with the intent of simulating all degrees of perineal lacerations. Our model enables trainees to practice the performance of midline or mediolateral episiotomy as well as the reconstruction of the perineal body from 1st to 4th degree laceration. Additive manufacturing can enhance simulation training within the field of OBGYN by improving the availability and quality of training models. We have demonstrated the feasibility of incorporating additive manufacturing technology into the creation of a task training model to meet the demand for enhanced education of our trainees.

DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS: William A. Zammarrelli: Nothing to disclose; Amy O'Boyle: Nothing to disclose; Peter Liacouras: Nothing to disclose.

14 Postoperative opioid prescribing following gynecologic surgery for pelvic organ prolapse

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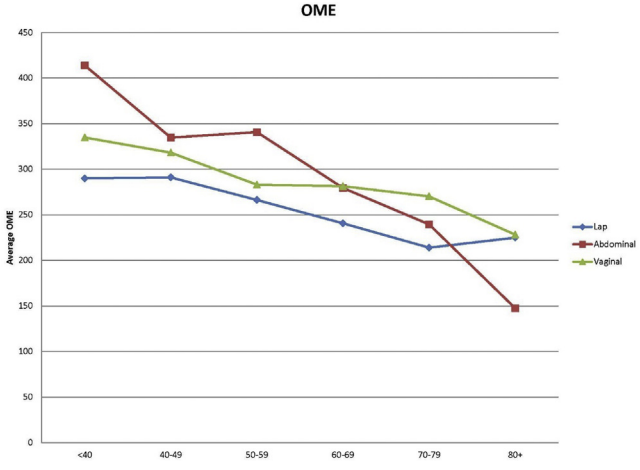
OBJECTIVES: To evaluate the association of opioid prescribing patterns following surgical treatment of pelvic organ prolapse and whether prescribed doses varied by pain scores and other procedural and patient factors.
MATERIALS AND METHODS: This retrospective cohort study used institutional billing data to identify all patients from January 1, 2012, through May 30, 2017, undergoing pelvic reconstructive surgery with planned overnight stay. Inpatient records were utilized to obtain pain scores and prescription data which were converted into oral morphine equivalents. Patients with a history of opioid use 8-90 days prior to surgery were excluded. The cohort was reviewed and organized by surgical approach (open, laparoscopic, vaginal), number of concomitant procedures and patient age stratified by decade. These factors were then matched to postoperative pain scores, amount of opioid prescribed at discharge and number of subsequent opioid refills. Pain scores and opioid use were also compared for correlation. The chi-square analysis was utilized for categorical variables and student's t-test for continuous. Pearson's correlation coefficient was also utilized for correlation of pain scores to prescribed oral morphine equivalents and refills.
RESULTS: A total of 1,944 patients underwent surgical treatment of pelvic organ prolapse during the period investigated and met criteria for study participation. Of these, 113 were excluded secondary to preoperative opioid use. The remaining 1,831 opioid naïve patients were included. Evaluation of this cohort demonstrated that older patients (80 years or older) when compared to the youngest patients (<40 years of age) had significantly lower pain scores (median 1 vs. 3.5), amount of prescribed narcotics (median 225 ome vs. 300 ome) and number of prescription refills (5.1% within 30 days vs. 17.9%) (all P < 0.01). These differences persisted within each surgical

Opioid Prescription Data and Pain Scores by Patient Age

Age Group	Total	<40	40-49	50-59	60-69	70-79	80+	P-value
N	1831	112	301	463	521	355	79	
Median Oral Morphine Equivalents (OME) - "none" set to 0	225	300	262.5	300	225	225	225	<0.0001
Opioid Refill Within 30 Days	6.40%	17.90%	11.60%	5.60%	3.10%	4.80%	5.10%	<0.0001
Median Pain Score Closest to Discharge	2	3.5	3	2	2	2	1	<0.0001

approach stratum (all $P < 0.001$). As expected,there were significantly higher overall pain scores for abdominal approach vs laparoscopic vs vaginal (medians of 3, 2, and 2, respectively, $P = 0.002$). Surprisingly, opioid utilization and pain scores were not affected by the number of concomitant procedures performed. Finally, pain scores were directly correlated to the amount of opioid prescribed.

CONCLUSION: Pain scores, opioid prescription amounts, and refills varied by patient age and surgical approach but were unaffected by concomitant procedures. Further work in correlating pain scores to opioid utilization is needed to ensure appropriate prescribing patterns and reducing risks of opioid dependence and diversion.



DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS: Douglas A. Leach: Nothing to disclose; Amy E. Glasgow: Nothing to disclose; Elizabeth B. Habermann: Nothing to disclose; John A. Occhino: Nothing to disclose.

15 Randomized controlled trial of belladonna and opiate suppository during intradetrusor onabotulinum toxin-A injection

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OBJECTIVES: Intradetrusor onabotulimun toxin A (BTX-A) injection can be performed in the doctor's office under local anesthesia. We aimed to evaluate the effectiveness of belladonna and opiate (BO) suppository in adjunct to standard anesthesia for in-office BTX-A treatment. We hypothesized the addition of a BO suppository would reduce bladder injection pain.

MATERIALS AND METHODS: This was a prospective, randomized, double-blind, placebo-controlled study of patients undergoing BTX-A bladder injection at a single clinic. Participants were randomized by computer generated block randomization to receive a BO (belladonna alkaloid with morphine 16.2/7.5 mg) or placebo suppository. Suppositories were placed immediately prior to lidocaine-based anesthesia, which all participants received. All participants underwent a standardized injection procedure using the same rigid cystoscope, needle type, and injection pattern (20 injections total). Participants reported bladder pain using a 0-10 numeric rating scale. Pain scores were obtained before anesthesia and suppository (P0), 40 minutes after administration of anesthesia and suppository (PA), after first 10 bladder injections (P10), and immediately after completion of 20 injections (P20). Pain increase during procedure was calculated using the difference between PA and P10. Post void residuals (PVRs) were measured immediately post-procedure and two weeks later. Patient satisfaction with pain control was measured using a Likert scale. Our primary outcome was change in pain level from anesthetic baseline to mid-procedure (P10-PA). Secondary outcomes were PVR >200 mL and satisfaction with pain control. A needed sample size of 26 was calculated in order to detect a 50% difference in P10-PA with 80% power. Categorical variables and median pain scores were compared using Fisher's exact and Kruskal-Wallis tests, respectively. An intent-to-treat approach was used for all analyses.

RESULTS: Twenty-six participants were enrolled and randomized with 13 in each study arm. One participant was lost to follow-up. There were no statistically significant differences in demographic variables or medical comorbidities between the groups. Median P10-PA for the placebo group and treatment group was 4 (range, 1-10) and 5 (range, 0-9), respectively ($p = 0.94$). Median P20 scores for the placebo group and treatment group were 3 (range, 0-10) and 2 (range, 0-8), respectively ($p = 0.29$). There were no significant differences in pre-injection pain scores reported at P0 and PA. Post-procedure PVR >200 mL was noted in 5 (38%) of the placebo group and 3 (23%) of the treatment group ($p = 0.67$). Two-week post-procedure PVR >200 mL was noted in 3 (25%) of the placebo group and 2 (15%) of the treatment group ($p = 0.64$) for an overall rate of 20%. Eleven (84%) participants in each group reported being "mostly satisfied" or "very much satisfied" with pain control.

CONCLUSION: Addition of BO suppository to standard lidocaine-based anesthesia provided no added benefit to significantly reduce bladder injection pain. Suppository use did not increase risk of urinary retention immediately post-procedure or two weeks later. Satisfaction with pain control among BTX-A injection patients is high.

DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS: Edgar LeClaire: Nothing to disclose; Jennifer Duong: Nothing to disclose; Rachel Wykes: Nothing to disclose; Kevin Miller: Nothing to disclose; Tessa Winterton: Nothing to disclose; Milan Bimali: Nothing to disclose.