

• ABSTRACTS FROM SCIENTIFIC FORUMS •



The effect of preoperative weight loss on breast reduction complications in obese women

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Introduction: Obese patients with symptomatic macromastia are requested to lose weight to comply with the insurance coverage criteria for reduction mammoplasty.

Method: A study was performed to evaluate postoperative complications after reduction mammoplasty in obese women (BMI>30). The patients were divided into two groups, those who were successful at weight loss and those who were not successful. Data collection included demographic questions as well as the patient's initial weight and height, patient's weight at the time of surgery (amount of weight loss), bra cup size, if diabetic or smoker, breast specimen weight, and postoperative complications. This study was IRB approved.

Results: Of the group 88 (45%) had preoperative weight loss (mean 27±9 lbs) and 107 (55%) had no weight loss. The groups were not significantly different ($p>0.05$) in age (29±10 vs. 28±11), initial BMI (34±2 vs. 33±3), bra cup size (DD vs. DD) frequency of diabetes (5% vs. 4%), frequency of smokers (2% vs. 2%) and specimen weight (911±129 vs. 927±113 grams). At the time of surgery the mean BMI of the group that loss weight was 30±2 and of the group that had no weight loss was 33±3. No significant difference ($p>0.05$) was noted regarding surgical site infection (9% vs. 8%), fat necrosis (5% vs. 5%) and nipple necrosis (4% vs. 5%). There were no significant differences in the need for revisions or re-operations (3% vs. 3%, $p>0.05$).

Conclusion: Our findings indicate that preoperative weight loss does not significantly decrease the complication rate of reduction mammoplasty in obese women.

Increasing Proportion of Elderly Patients in Surgery Services

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Introduction: The proportion of elderly people is increasing in the world population. By 2040 it is estimated that about 30% of our region's population will be aged over 65 years. To meet the challenge of providing health care to the elderly, we have to start evaluating the amount of patients that require surgical services in this age group.

Method: We compared the surgical cases in the year 2014 with those in 2019 at the Surgery Department's database. Variables examined included age, gender, American Society of Anesthesiology (ASA) classification, and outcome. This database was IRB approved.

Results: A statistically significant ($p < 0.001$) increase in patients ≥ 65 years of age occurred between 2014 (27%) and 2019 (31%). The mean age of patients increased from 48 ± 23 to 50 ± 22 . ASA ≥ 3 and eventful outcomes became all more frequent as elderly patients increased (table 1).

Table 1

	Year 2014 n=4,906		Year 2019 n=4,954		P
	Age < 65 years n=3,579	Age \geq 65 years n=1,327	Age \geq 65 years n=3,445	Age < 65 years n=1,509	
Males	1,582 (45%)	589 (45%)	1,467 (43%)	682 (45%)	0.27
ASA ≥ 3	366 (13%)	346 (32%)	1007 (31%)	839 (59%)	<0.001
Eventful outcome (morbidity & mortality)	97 (3%)	63 (5%)	82 (2%)	40 (3%)	0.004

Conclusion: Despite the fact that only 21% of our current population is 65 years of age or older, over 30% of the patients requiring surgery during the past year were in this age group. Elderly patients will represent about one third of the surgery workload.

Plantar Artery Bypass for Chronic Limb Threatening Ischemia: Patency and Limb Salvage

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Introduction: We evaluated whether plantar artery is a viable target for limb salvage bypass surgery when compared to distal tibial bypass in patients with chronic limb threatening ischemia.

Method: All patients who underwent bypass with vein from popliteal artery to a distal target were analyzed retrospectively, using EMR data from July 2012 to June 2018. Demographic data, indications for surgery, limb salvage, and patency were recorded. Exclusion criteria were inflow vessels above the knee, acute limb ischemia, and the use of PTFE. This study was approved by IRB.

Results: Ninety procedures were performed from the below the knee popliteal artery (POP) to either the anterior tibial (AT), dorsalis pedis (DP), posterior tibial (PT), peroneal (Per), or plantar artery (plantar). Indications were rest pain in 10 patients (11%), ulceration in 23 patients (26%), and gangrene in 57 patients (63%). There were two Pop-AT (2.2%), forty-one Pop-DP (45.5%), four Pop-Peroneal (4.4%), twenty-three Pop-Plantar (25.6%), and twenty Pop-PT (22.2%). Median follow up was 17 months. The limb salvage at one year for plantar artery bypass was 76.9% (17 patients) in comparison with 86.5% (58 patients) of all other distal bypasses. Using Cox regression at 1- and 3-years plantar bypasses have patency of 70% and 50% compared to 78% and 60% of all other distal bypasses. ($P=0.48$, HR: 1.33, CI: 0.60-2.98).

Conclusion: Using Infra-genicular bypass with vein to a plantar target when no other target is available, is an option for limb salvage in patients with CLTI.

Surgical Research Summer Program: Improving Academic Output in a Community Hospital Surgery Residency

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Purpose: Our institution designed a model Surgical Research Summer Program (SRSP) that integrates undergraduate and medical students into ongoing clinical research projects, while also providing clinical experience. Our aim is to assess the impact of such program in the academic productivity of a new surgery residency and its value for participants.

Methods: An IRB approved single institution review of clinical research output derived from the yearly SRSP from May 2015 to May 2019 was performed. SRSP participants were surveyed to assess their satisfaction with the program and its impact on their career.

Results: A total of 20 projects involving 32 participants were performed. Academic output from the SRSP is summarized in Table 1. The SRSP alumni questionnaire had a 53% response rate. A total of 41.2% continued post-doctoral training in surgical specialties, while 47% had not yet applied to specialty training. A peer-reviewed presentation or publication was obtained by 47% of participants. Of those who had decided for specialty training, 66% found the program very valuable or above to making that decision. A 94% declared that they would continue to engage in research throughout their career, with 29% remaining active in their research project after concluding the SRSP.

Conclusion: The model of the SRSP provides a reproducible model to promote and enhance academic research productivity at community hospitals lacking formal research departments. It also provides a unique opportunity for residents to mentor younger trainees and cultivate leadership skills.

	2015	2016	2017	2018
Projects	5	3	6	6
Students	5	5	10	12
Posters Presentations	1	1	5	1
Oral Presentations	15	3	3	2
Peer-Review Publications	5	1	1	0
Quality Improvement	2	1	1	1

Stringed stent placement in children undergoing ureteroscopy: a potential solution to the retained stent problem

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Introduction: Ureteral stent retention is a well-known problem among local urologists in Puerto Rico. Puerto Rico has high incidence rates of Double-J catheter (JJ) retention with complications leading to stent calcification, nephrectomy, need for 2 stage surgical removal or ESRD. We have identified that one of the main causes leading to stent retention is lack of follow up. Our study aims to document the outcomes of stent placement with string as a means to prevent the occurrence of retained stents.

Methods: We conducted a retrospective cohort study using our clinic's database on patients that underwent stent placement with string after ureteroscopy. Patients were operated by the same surgeon (MPB) over 11 years. We compared age, post-operative stent side, outcomes and complications. Approved by IRB.

Results: Our inclusion study was comprised of 78 pediatric patients that underwent ureteroscopy for urolithiasis (n=78). The patient population comprised of 29 males and 49 females with a mean age of 15.4 years. Only 4% patient exhibited bilateral stent. Only 7 (9%) patients developed complications after stent placement. Stone recurrence was observed in 10 patients with stent and only 2 had residual stones after initial intervention.

Conclusion: Due to recent historic events at our island, such as the passage of hurricane Maria in 2017, the ongoing economic crisis and COVID-19 pandemic, cancelation of elective surgeries has led to a longer time with ureteral stents and prolonged definitive treatment. Our study suggests that placing ureteral stents with strings serves as an excellent method to reduce complications associated with retained stents.

Sex hormone levels and semen profiles in adolescents with varicoceles

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Introduction: A varicocele is defined as an abnormal dilatation of the veins of the pampiniform plexus that drain the testis and is a common problem in the practice of reproductive medicine. Follicle Stimulating Hormone (FSH) is a gonadotropin hormone produced by the anterior pituitary gland. Varying levels of FSH could indicate impairment of the process of spermatogenesis and could prove a valuable marker for assessing indications for treatment of a varicocele and/or efficacy of such treatment.

Methods: Hormonal and Doppler ultrasound parameters were assessed in 92 adolescents with varicoceles of all Tanner stages with an average age of 13.64 years. Testicular volumes were assessed by ultrasound and early morning blood samples were obtained to measure serum FSH, LH and Testosterone levels. This study was approved by the IRB.

Results: The predominant abnormal sex hormone pattern in our patient population was low serum FSH and low testosterone. Of the 61 patients who had hormonal assays performed, 20 (33%) had low serum FSH and 14 (23%) had low total testosterone levels. Fifty-two of the 92 total patients (57%) presented testicular volume asymmetry (>20% volume difference). Of the 52 patients with testicular volume asymmetry, 18 (35%) had abnormal serum sex hormone levels.

Conclusion: This study suggests that sex hormone levels may be affected in this patient population, perhaps due to a hostile environment within the seminiferous tubules that may impair spermatogenesis and sex hormone synthesis within the testis. Hypogonadism then should be considered as an indication for varicocele repair in adolescents.

The Epidemiology of Trauma in Patients with Mental Disorders

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Introduction: The health outcomes of trauma patients with mental disorders remain unclear. We explored the influence of mental disorders on injury-related and hospital course factors, and outcomes after trauma.

Method: We conducted an IRB-approved retrospective study of 23,500 adult patients admitted to the Puerto Rico Trauma Hospital between 2002-2019. Participants were divided into 2 groups according to their exposure status (presence or absence of psychiatric illnesses). Group comparisons were performed using Pearson's chi-square and Mann-Whitney U tests. Statistical significance was set at 0.05.

Results: Patients with mental disorders were older, with a median (interquartile range) age of 43 (23) years vs. 35 (28) years ($p<0.001$), and had higher frequencies of comorbidities (41.3% vs. 22.2%; $p<0.001$) and self-inflicted injuries (4.3% vs. 0.7%; $p<0.001$). More exposed patients presented with injury severity scores > 15 (43.0% vs. 40.1%; $p=0.005$). Having any mental disorder was associated with an increased risk of complications. This risk increased with age, reaching its maximum effect in the 51-65 year age group (AOR=1.59; 95%CI: 1.31-1.94). Exposed patients with a Glasgow coma scale (GCS) of 15 had a 42% (95%CI: 1.17-1.73) higher risk of dying, while a protective effect was seen for those with a GCS < 9 (AOR=0.79; 95%CI: 0.64-0.99).

Conclusion: Our results suggest that the presence of a psychiatric illness is associated with worse prognosis and outcomes after trauma. Mental health screening is an essential component of the management of trauma patients, as addressing the specific health needs of those with psychiatric illnesses could help improve outcomes.

Elderly admission trends at the Puerto Rico Trauma Hospital: A time-series analysis

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Introduction: The aging process places the elderly, a worldwide increasing age group, at an increased risk for trauma. This study aims to explore changes over time in admission rates, socio-demographical, clinical, and injury-related data in elderly patients (≥ 65 years) admitted to the Puerto Rico Trauma Hospital (PRTH) during 2000-2019.

Method: An IRB-approved time-series analysis was conducted. Admission rates were analyzed by fitting an exponential growth curve model. Trends were assessed using the Cochrane-Armitage and Cuzick tests for categorical and continuous data, respectively. Statistical significance was set at $p<0.05$.

Results: Elderly admission rates to the PRTH have shown growth over the past two decades, from 6.2 cases per 100 overall admissions in 2000 to 18.2 in 2019. This trend is projected to continue with an estimated 24.8 (95% CI: 21.7-27.8) cases per 100 overall admissions in 2023. Trends for mechanisms of injury such as motor vehicle accidents and pedestrians showed a significant decrease over time, while falls presented a clear positive trend, showing an increase from 25.6% in 2000-2004 to 46.2% in 2015-2019. Both Injury Severity Score ≥ 25 and Glasgow Coma Scale ≤ 8 , declined significantly through time. Finally, In-hospital mortality presented a decreasing trend from 31.7% in 2000-2004 to 21.5% in 2015-2019.

Conclusion: Our analysis demonstrates an increase over time in elderly admissions, especially fall-related trauma. Also, it projects this upward trend will continue. This imposes new challenges for PRTH and other health care services and is a gateway for the implementation of adapted clinical management.

The COVID-19 State-Mandated Lockdown; Comparison of Economic closure and Reopening on the Trauma Admissions to the Puerto Rico Trauma Hospital

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Introduction: Despite pandemic-related world-wide restrictions to social life, patients still experience trauma. This study sought to determine the impact of such restrictions on the number of trauma admissions, patients' profile and mechanisms of injury.

Method: An IRB-approved quasi-experimental study was conducted with data from the Puerto Rico Trauma Hospital Trauma Registry. We selected two lockdown periods: Economic Closure ([EC] March 15-May 03, 2020) and Economic Reopening ([ER] May 04-June 15, 2020). These periods were compared to equivalent time periods in 2017-2019 using the test of proportions and the Pearson's chi-square test. Statistical significance was set at $p < 0.05$.

Results: Thirty-seven patients were admitted to our hospital during the EC and 113 during the ER, while 179 and 147 admissions, on average, were registered for their respective control periods. These numbers accounted for drastic decreases in total admissions throughout the EC (80%; $p < 0.01$) and the ER (25%; $p = 0.03$). Furthermore, the proportion of admissions of people ≥ 41 years increased from 50% to 72% in the EC ($p = 0.01$) and from 48% to 59% in the ER ($p = 0.03$). During the EC, motor vehicle accidents (36% vs. 25%), pedestrians (15% vs. 6%), and assaults (23% vs. 19%) experienced non-significant reductions ($p > 0.05$). Instead, falls significantly rose from 18% to 38% ($p < 0.01$). However, throughout the ER, almost all mechanisms either reached or were close to reaching the pre-lockdown (i.e., expected) values.

Conclusion: The state-mandated lockdown led to the expected decrease in trauma admissions during its enactment along with changes in patient's demographic and presenting mechanism of injury.

Endovascular Management of Traumatic Aortic Injury in Puerto Rico - single surgeon experience.

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Introduction: Traumatic aortic injury (TAI) is a low-incidence but life-threatening condition. Since 2011, eligible patients with TAI at the Puerto Rico Trauma Hospital (PRTH) have been repaired with endovascular approach. Our objective was to describe the outcomes of all TAIs repaired by an endovascular approach at our institution.

Method: An IRB-approved case-series analysis was conducted with data from the PRTH Trauma Registry. The domains measured were sociodemographic profile, injury characteristics, hospital course, and outcomes (i.e., hospital length of stay (LOS) and mortality). The statistical analysis is expressed as mean \pm standard deviation or frequencies and proportions, as appropriate.

Results: A total of 59 TAI patients that underwent endovascular repair between 2011-2020 at the PRTH were preliminary identified. Fifty-one (86.4%) patients were male, and the mean age was 37 ± 17 years. Of the cohort, 12 (20.3%) patients had public health insurance and 3 (5.1%) were uninsured. The most common trauma mechanism was motor vehicle accident (46; 78.0%), followed by pedestrian (6; 10.2%), fall (5; 8.4%), and gunshot wound (2; 3.4%). The average injury severity score of this cohort was 27 ± 6 points. Thirty-two (54.2%) subjects required intensive care unit (ICU) admission, for which the mean ICU stay was 24 ± 18 days. Moreover, the mean hospital LOS amounted to 33 ± 27 days, and 3 (5.1%) patients died while in hospital.

Conclusion: TAI is an infrequent but lethal condition affecting a healthy young population in Puerto Rico. Endovascular repair of TAI is a promising solution which can be performed safely at PRTH with low morbidity and mortality.

Trends and Outcomes of Trauma Patients Testing Positive for Marijuana and Cocaine

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Introduction: Recent years have marked an increase in drug use due to their acceptance, accessibility, and commonality among the population. Substance misuse has long been recognized as a major predisposing risk factor for traumatic injury. However, there still exists no clear scientific consensus regarding the impact of drug use on patient outcomes. Therefore, this study aims to evaluate the demographic profile, hospital-course factors, and outcomes of trauma patients based on their toxicology.

Method: This is a non-concurrent cohort study approved by IRB. It included 3,709 patients treated at the Puerto Rico Trauma Hospital during 2002-2018. The sample was divided into four groups according to their toxicology status. Comparisons were conducted using Pearson's chi-square and Kruskal-Wallis tests. The odds of death were examined with unconditional logistic regressions. Significance level was $p < 0.05$.

Results: Thirty percent of patients presented positive toxicology. Marijuana use was most common in subjects aged 18-24 (36.4%), marijuana and cocaine in patients aged 25-34 (36.3%), and cocaine in those aged 35-44 (27.2%) ($p < 0.001$). Positive toxicology patients underwent surgery more often than negative testing patients (marijuana positive: 68.7%, cocaine positive: 65.6%, marijuana & cocaine positive: 69.8%, negative: 57.0%; $p < 0.001$). No variation was found in in-hospital mortality after adjusting for confounders.

Conclusion: Our results show an association between positive toxicology for either marijuana, cocaine, or both and a higher need for surgery. However, other variables like in-hospital mortality showed no variation. Therefore, this study provides valuable information on the clinical profile of patients with positive toxicology.

Impact of Prehospital Time on Trauma Outcomes in Puerto Rico

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Introduction: Delayed treatment is one of the most cited causes for preventable trauma death. However, the literature has yet to reach a consensus on the effects of prehospital time (PHT) in patient outcomes. This study aimed to compare the sociodemographic profile, injury characteristics, and outcomes between patients who arrived < 60 minutes (short PHT) and ≥ 60 minutes (long PHT) of injury at the Puerto Rico Trauma Hospital.

Method: An IRB-approved retrospective analysis was performed with a sample of 752 patients admitted to our hospital during 2014-2019. Group comparisons were done using Pearson's chi-square, Fisher exact, or Mann-Whitney U tests, as appropriate. Association between PHT and outcomes was determined through logistic regressions. Statistical significance was set at $p < 0.05$.

Results: Of the total sample, 627 (83.4%) subjects had long PHTs. These patients were older than those with short PHTs, with a median (interquartile range) age of 38 (31) years vs. 34 (20) years ($p = 0.01$). They were also more likely to have fallen (14.5% vs. 8.0%) and less likely to have suffered gunshot wounds (15.8% vs. 24.8%) or pedestrian accidents (12.4% vs. 20.8%) ($p < 0.01$). Furthermore, patients with long PHTs had lower ISSs ($p < 0.01$) and higher GCSs ($p < 0.01$). Long PHT was associated to a 59% (95%CI: 0.24-0.68) reduced odds of mortality, but statistical significance was lost after adjustment. No significant associations were found for hospital LOS or complications.

Conclusion: Patients with long PHTs were older and less severely injured than their short PHTs counterparts. However, PHT did not significantly impact hospital LOS, complications or mortality.

The value of initial serum lactic acid levels for predicting morbidity and mortality of patients admitted to the Puerto Rico Trauma Hospital

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Introduction: Trauma patients are commonly found with high serum lactate levels due to hypovolemia, injuries and different types of shock. The primary objective of this study is to evaluate and describe if there is an association between initial serum lactate levels (iSL) of trauma patients with morbidity and mortality in the Puerto Rico Trauma Hospital (PRTH) and its possible use as a screening tool in the Trauma triage setting.

Method: A retrospective study trauma patients ≥ 18 years whose iSL was drawn during the first 48 hours after admission to the PRTH between July 2014 and June 2019. Patients were divided in two groups: High (≥ 19.9 mg/dL) and Normal (4.5-19.8 mg/dL) iSL. Comparison between groups was done using t-test (or Mann-Whitney test) and Pearson's Chi-square, accordingly. Multivariate regression was done to study the association of iSL with poor outcomes. Approved by IRB (B0030119).

Results: A total of 539 patients were evaluated (294 with High and 245 with Normal iSL). Both study groups consisted of $>74\%$ male patients. In the High group more patients presented with higher ISS, serum creatinine levels, admission to TICU, need for mechanical ventilation (MV), MV days and length of stay, and lower GCS and albumin levels when compared to the control group. In multivariate analysis, patients with High iSL were significantly associated with the risk of in-hospital mortality [OR: 1.8 (CI: 1.02-3.21)].

Conclusion: High initial serum lactate levels is associated with risk of in-hospital mortality and a longer and more severe course of hospital stay.

Changing the Culture of Pilonidal Disease Surgery: Short Term Outcomes of Minimally Invasive Management vs. Excision.

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Purpose: Pilonidal disease is a common disease among the pediatric population, traditionally managed with surgical excision. The Gips procedure now offers a minimally invasive approach to treat this disease. This study aims to compare at the short-term outcomes of treating chronic pilonidal disease with excision vs. the Gips procedure.

Methods: An IRB approved single institution retrospective review of the management and outcomes of chronic pilonidal disease presenting between January 2016 and January 2020 was performed. Patients with pilonidal abscess were excluded.

Results: A total of 54 patients were included, with a median age of 17 years. There were 16 patients treated with excision and 38 patients managed with Gips procedure. The excision cohort was 50% male, median age of 17.2 (IQR 14.7 – 18) years, and median weight of 63.6 (IQR 56.4 – 77.6) kg. The Gips cohort was 21% male, median age of 16.7 (IQR 15.7 – 17.9) years, and median weight of 77.3 (IQR 63.4 – 89.1) kg. Median time of surgery for excision was 35 (IQR 25 – 40) minutes, while that of Gips was 10 (IQR 10 – 15) minutes [p-value <0.001]. The median time of disease resolution for the excision vs Gips procedure was 15 (IQR 9 – 15) days and 15.5 (12 – 29) days [p-value >0.05], respectively.

Conclusion: The use of GIPS procedure for chronic pilonidal disease shows similar time of disease resolution as resection technique, while also having the advantage of significantly lower surgical time. Longer follow up is necessary to properly assess recurrence rate and long-term outcomes.