

## • ABSTRACTS FROM SCIENTIFIC FORUMS •

**SURGICAL RESEARCH  
F.L. RAFFUCCI  
FORUM**

**41<sup>st</sup>  
F.L. RAFFUCCI  
MEMORIAL LECTURE &  
SURGICAL RESEARCH  
FORUM**

Friday, February 25, 2022 | 8:00 AM  
Virtual Meeting

**Reynold López-Enríquez, MD**  
Chairman

**Norma Cruz, MD**  
Moderator

  Raffucci Surgical Education Foundation  
American College of Surgeons, Puerto Rico  
Department of Surgery, UPR-RCM

### The Risks of Breast Reduction Surgery in Former Smokers

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**Introduction:** It has been reported that cigarette smoking affects wound healing and increases the complication rate in breast surgery.

**Method:** A prospective cohort study was performed to evaluate postoperative complications after reduction mammoplasty in former smokers and never smokers. A period of 4 weeks of preoperative and 4 weeks of postoperative abstinence from smoking was requested for all participants who were smokers. Only women who were successful at discontinuing smoking for the requested period of time and had a negative preoperative urine test for nicotine metabolites were offered surgery. Data collection included demographic questions as well as preoperative smoking history, if patient was diabetic, body mass index, breast specimen weight, and postoperative complications. This study was IRB approved.

**Results:** The study evaluated 299 women who had reduction mammoplasty. Of the group 61 (20%) were former smokers and 238 (80%) were never smokers. The groups were not significantly different in age ( $31\pm 12$  vs.  $30\pm 11$ ), body mass index ( $32\pm 3$  vs.  $33\pm 3$ ), frequency of diabetes (5% vs. 4%), and weight of breast tissue resection ( $928\pm 119$  vs.  $931\pm 127$ ). The study found a significantly ( $p<0.05$ ) higher frequency of postoperative complications in former smokers. These complications included surgical site infection (12% vs. 3%), wound dehiscence (13% vs. 3%), fat necrosis (12% vs. 2%), nipple necrosis (15% vs. 2%) and the need for re-operation/revision (10% vs. 1%).

**Conclusion:** Our findings indicate that former smokers have higher complication rates in spite of following the recommended period of abstinence from smoking of 4 weeks before and after surgery.

## The COVID-19 Pandemic and the Surgical Workload of the UPR-affiliated Hospitals

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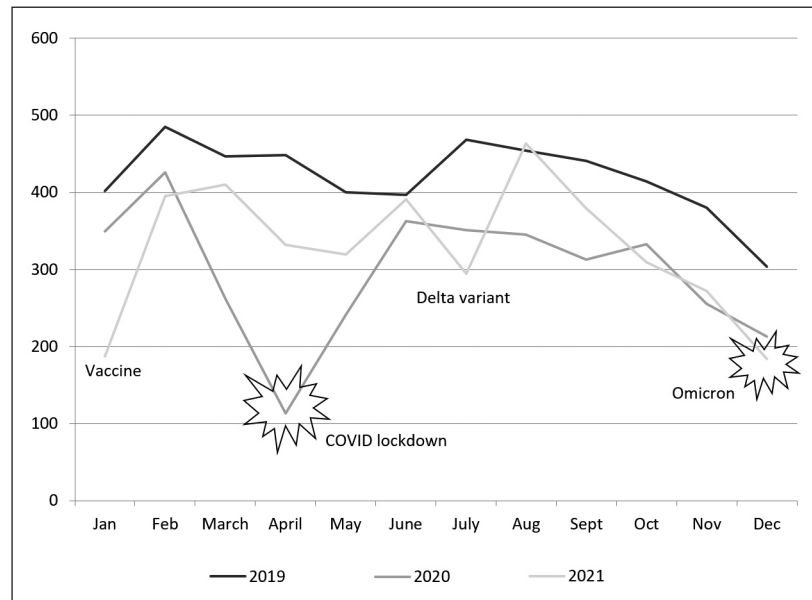
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**Introduction:** The World Health Organization declared the COVID-19 outbreak a pandemic on March 11, 2020. Health care institutions had to provide attention to the large number of COVID patients and other services had to downscale their usual work. We evaluated how the pandemic affected our surgical workload.

**Method:** Using the University of Puerto Rico (UPR) Surgery Department database, we evaluated the number of surgical cases and their characteristics during the years 2019 to 2021. Variables examined included age, gender, American Society of Anesthesiology (ASA) classification, type of surgery (elective or emergency), type of admission (outpatient or admitted), and outcome. This database was IRB approved.

**Results:** A total of 12,539 cases had surgery between 1/1/2019 and 12/31/2021. The mean age was  $50 \pm 23$ . Four significant periods were identified and correlated to the number of surgical cases: the COVID-19 lockdown (March 2020), first vaccine became available (January 2021), the increase in cases caused by the Delta variant of the virus (July 2021) and the Omicron variant (December 2021) as seen in Table 1. The number of surgical cases, decreased (30%) from 5,040 in 2019 to 3,564 in 2020 and to 3,935 in 2021. However, no significant difference was found between the groups regarding age, gender, admission type, ASA classification, surgery type, or outcome.

**Conclusion:** The COVID-19 pandemic resulted in a significant decrease in the number of surgical cases, but the characteristics of the surgical patients remained the same.



**Table 1.** Number of surgical cases per month 2019-2021.

## National Survey on the Use of Smartphone Adaptors for Endoscopy Among Otolaryngology Residents

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**Introduction:** Endoscopy is an essential diagnostic tool in Otolaryngology. The ability to record awake endoscopic exams has been limited for decades. However, smartphone adaptors for recording endoscopic procedures have become recently available. With this study we aim to evaluate the current use of smartphone endoscopy adaptors among Otolaryngology residents.

**Methods:** This study is approved by IRB. A survey instrument was developed and electronically sent to ACGME-accredited Otolaryngology programs. Responses were recorded anonymously.

**Results:** N=56 completed the survey. 41.1% reported smartphone-coupled adaptors are used in their training program. Majority were lower-level residents and used the device to communicate findings of emergency room and inpatient consults. 63.6% of the 58.9% that do not use these devices, stated the cost or lack of availability as the reason behind their lack of use.

**Conclusion:** Multiple studies have shown that the ability to create and share video recording of flexible nasolaryngoscopy leads to an improvement in the quality of patient care and resident education. Consequently, it is crucial to explore if Otolaryngology Departments have these devices between their armamentariums. To the extent of our knowledge, this is the first study that explores the use of smartphone-coupled adaptors between Otolaryngology staff. The current study demonstrates that smartphone-coupled adaptors for endoscopy are not being used by all trainees. Among non-users, there is interest to adopt the technology but the cost and lack of availability are the limiting factor. With this National Survey, we encourage all the Otolaryngology Departments to consider having this technology available.

## Surgical Management of Thyroid Illnesses in Children

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**Introduction:** Thyroid disorders account for a large proportion of pediatric endocrine disorders, being the second most common worldwide. Surgery is used to manage thyroid illnesses such as: cancer, goiter, hyperthyroidism, and solitary non-toxic nodules. This study describes the surgical experience of 108 consecutive pediatric patients who underwent thyroidectomies between 2001 and 2018 by the senior author (HLV) at the University Pediatric Hospital in San Juan PR.

**Methodology:** Recorded data include age, gender, race, weight, past medical history, type of thyroid illness, nodule size, pre-operative ultrasound findings, pre-operative FNA findings, radiation exposure history, type of thyroid resection, surgical operation time, novel technique used, recovery time, complications, need of further surgery, remission, relapse rate post resection, radioactive iodine therapy, and follow up. This study was approved by the UPR-IRB.

**Results:** Thyroid illness diagnosis included differentiated thyroid carcinoma (39%), Hashimoto's disease (16%), and Grave's disease (12%). Most common procedures were hemithyroidectomy with isthmusectomy (36%), total thyroidectomy with central lymph node removal (32%), and total thyroidectomy (20%). Seven children suffered complications; recurrent laryngeal nerve injury (2%) and neck hematoma (2%) were the most prevalent.

**Conclusion:** Children with thyroid disorders benefit from a thyroidectomy depending on the nature and stage of illness. Proper diagnosis, surgical intervention, and use of novel techniques led to 108 successful resections with only seven complications which were all managed during surgery or post-op care. Intraoperative nerve monitoring coupled with surgical technique reduced the incidence of recurrent laryngeal nerve injury. Vessel sealers reduced operative time.

## Endovascular Management of Axillosubclavian Arterial Injuries at the Puerto Rico Trauma Hospital - Single Surgeon Experience

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**Introduction:** Injuries to the axillosubclavian vessels carry high morbidity and mortality, despite representing only about 9% of vascular injuries. Management of axillo-subclavian injuries can be performed with open or endovascular approaches, with recent data linking endovascular treatment with improved outcomes. Our goal was to describe the characteristics and outcomes of all axillosubclavian injuries repaired by an endovascular approach at PRTH.

**Method:** An IRB-approved case-series analysis was conducted with data from the PRTH Registry and a single-surgeon specific registry. The domains were sociodemographic profile, injury characteristics, and outcomes. The analysis is expressed as median (range) or frequencies and proportions.

**Results:** From January 2011 to January 2021 there were 13,974 admissions to the PRTH. Fifteen (0.11%) patients were identified that underwent endovascular procedure due to an axillosubclavian injury. Thirteen (86.7%) patients were male, and the median age was 32 (17-69) years. Thirteen (86.7%) patients had public insurance and 1 (6.7%) was uninsured. The most common injury type was penetrating (9; 60.0%), and the prevalent injury mechanism was gunshot wound (8; 53.3%). The median ISS was 20 (9-75), and the most common diagnosis was pseudoaneurysm (9; 60.0%). The median hospital LOS was 26 (3-84) days, and 2 (13.3%) patients died while hospitalized. The median follow-up was 9.4 (0.4-70.4) months.

**Conclusion:** Axillosubclavian vessel injuries are an infrequent but lethal condition affecting a healthy young population in PR. Endovascular repair has been performed with good results at the PRTH for 10 years. Long-term follow-up is ongoing to aid with the surveillance of this population.

## An Exploratory Study of the Impact of Excessive Length of Stay in the Puerto Rico Trauma Hospital

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**Introduction:** Excessive length of stay trauma population (exLOST) is characterized by high injury burden, complications, and morbidity. This translates to an elevated use of resources and high expenses to the hospital and patients. Considering the critical economic situation in Puerto Rico and the constant increment in healthcare costs, it is crucial to evaluate options for reducing healthcare costs to maintain service efficiency and high-quality care.

**Method:** We conducted an IRB-approved cross-sectional study of patients, treated at the Puerto Rico Trauma Hospital from 2017-2019, to determine sociodemographic and clinical factors associated with exLOST, and the effect of the latter on reimbursement rates. Group comparisons were performed using Pearson's chi-square and Mann-Whitney tests. Factors associated to exLOST were examined using a logistic regression, while the effect of the exLOST on reimbursement rates was ascertained through a median regression.

**Results:** Of a total of 2,835 patients admitted during the study period, 417 (14%) were exLOST. Factors associated with exLOST included age >35 years, Medicare insurance, alcohol abuse disorder, external trauma, (pulmonary, renal, musculoskeletal) complications, and discharge to SNF/Rehab facility. Face trauma and discharge to morgue were inversely related to exLOST. Furthermore, exLOST was associated with a median increase in the reimbursement rate of 11% (95% CI: 5.3 – 16.7).

**Conclusion:** These results suggest which sociodemographic and clinical factors could lead to exLOST. Moreover, the unexpected finding regarding the better reimbursement rate in exLOST patients warrants further investigation. This study will help focus on the right targets to reduce treatment costs while maintaining high-quality care.

## Frequency of Germline Pathogenic Mutations in Puerto Rican Men with Prostate Cancer

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**Introduction and Objectives:** Since 2019, updated recommendations from the National Comprehensive Cancer Network (NCCN) include germline genetic testing and counseling in select men with prostate cancer (PCa). Finding pathogenic mutations may enhance family counseling as well as identify patients for alternative systemic therapy such as PARP inhibitors. We reviewed our experience to ascertain the frequency of genetic mutations in the Puerto Rican population.

**Methods:** Since 2019, all patients referred to our clinic with PCa and fulfilling NCCN criteria underwent genetic counseling and testing. The commercially available Invitae Genetics© hereditary prostate cancer panel included the following genes: BRCA1, BRCA2, ATM, HOXB13, CHEK2, EPCAM, MLH1, MSH2, MSH6, NBN, PMS2, and TP53. Study is approved by IRB.

**Results:** 96 consecutive PCa patients meeting the NCCN criteria underwent genetic counseling and testing. Nine patients (9.5%) underwent testing with saliva and 90.5% with blood. Of 89 patients with available results, pathogenic genetic mutations were identified in 14.6% (13/89) of patients. Notable mutations included BRCA 2 (2 patients), ATM (2), HOXB13 (1), and BRIP1 associated with autosomal dominant hereditary ovarian cancer (1).

**Conclusions:** Nearly 15% of Puerto Rican patients diagnosed with prostate and fulfilling NCCN criteria for germline genetic testing harbored pathogenic mutations, including 6.7% of them with highly pathogenic mutations in BRCA2, ATM, or HOXB13. This study supports NCCN recommendations for integration of germline genetic testing in Puerto Rican PCa patients. Health policy and education efforts are warranted.

## **Injury and Cost Pattern Differences between Homeless and Housed Trauma Patients Admitted to the Puerto Rico Trauma Hospital**

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**Introduction:** The increasing rate of homelessness in Puerto Rico is a burden to the ER's and the healthcare system. This population's increased risk of traumatic injuries influenced by their living conditions makes them a representative fraction of recurrent ED visitors. In turn, it causes disproportionate costs of hospitalization. Our aim was to compare the injury and costs patterns between Hispanic homeless and housed patients admitted to the PR trauma hospital.

**Methods:** An IRB-approved cross-sectional study was performed with patients admitted to our hospital during 2018. The study parameters included socio-demographic profile, injury-related parameters, trauma outcomes, and costs. Group comparisons were performed using Pearson's chi-square and Mann-Whitney U tests

**Results:** A total of 1,258 patients were admitted into the PRTTH, of which 31 (2.5%) were identified to be homeless. The prevalence of males in the homeless group was marginally higher (93.4% vs. 80%;  $p=0.06$ ). They were also more likely to present with pedestrian/pedal cyclist injuries (58% vs. 14.2%) or gunshot wounds (19.4% vs. 15.4%) ( $p<0.001$ ). The mean ISS was higher for homeless patients than for housed ones, with 19.6 vs. 14.4 points ( $p=0.003$ ). Homeless was associated with longer median length of stays (LOS) (45 vs. 9 days;  $p<0.001$ ), marginally higher mortality rates (19.4% vs. 10.3%;  $p=0.10$ ); and higher overall costs (\$74,473 vs. \$19,764) compared to housed patients.

**Conclusion:** Homeless patients are more likely to have a longer LOS, higher mortality, and increased cost of stay than housed patients in the PRTTH. Future prevention efforts should be directed to this vulnerable population.

## **Outcomes of Surgical Rib Fixations vs. Non-operative Management in Patients with Traumatic Rib Fractures in the Puerto Rico Trauma Hospital**

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**Introduction:** Non-operative management along with supportive care has been the adopted approach for traumatic rib fractures; however, surgical approaches have emerged recently to treat this common pathology. Despite this, there are no guidelines for surgical rib fixation in patients with traumatic rib fractures.

**Methods:** An IRB-approved retrospective cohort study was performed at the PR Trauma Hospital aiming to compare the socio-demographic and clinical profile, hospital course, and outcomes between patients with traumatic rib fractures who undergo surgical fixation and their counterparts with non-operative management. The study period comprised from January 2016 through July 2020. Outcomes were evaluated with negative binomial and logistic regressions.

**Results:** Fifty patients were identified for the surgical rib fixation group, who were matched to 150 patients who received non-operative management. The majority were male (91.5%), with a median (interquartile range) age of 53 (29) years old. Concomitant chest injuries were significantly more prevalent in the operative group ( $p<0.05$ ), such as flail chest, number of fractures and displaced rib fractures. Although hospital LOS was 25% (95% CI: 1.02-1.54) longer for the surgical group, these patients were 85% (95% CI: 0.03-0.70) less likely to die in-hospital when compared to patients with conservative management.

**Conclusion:** Rib fixation may offer benefits in terms of mortality in selected patients with traumatic rib fractures, such as those with bilateral rib fractures, multiple displaced rib fractures, flail chest and concomitant thoracic injuries. This study may serve as a guide for treatment strategy and patient selection regarding the surgical management of traumatic rib fractures.



## Transperineal Mri-Ultrasound Fusion Biopsy: First Report In The Puerto Rican Population

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**Introduction:** Despite modifications in antibiotic strategies and rectal cultures, transrectal prostate biopsies continue to be associated with a low but significant risk of febrile UTI. We reviewed our experience transitioning to a transperineal (TP) approach for prostate biopsies.

**Methods:** An IRB approved record review of 183 men with a suspicion of prostate cancer who underwent TP prostate biopsy between 9/2020 and 10/2021 was done. Systematic biopsies consisted of 14 cores using a modification of the Michigan MUSIC template and 4 cores of each target if present. For comfort and to minimize patient movement, biopsies were performed with sedation and bupivacaine block, using ceftriaxone 1g or gentamicin 80mg IV prophylaxis. Post-biopsy antibiotics were not used.

**Results:** 183 patients underwent a TP prostate biopsy with UroNav coregistration. Median serum PSA was 5.4ng/ml, mean age 61.6years (median: 62), mean prostate volume 58.2cc (median: 50), and mean number of cores 17.5 (median 18). The positive biopsy rate was 44.3% (81/183) with the grade group distribution as follows: GG1 (24.7%), GG2 (35.8%), GG3 (27.2%), GG4 (2.5%), and GG5 (9.9%). Complications included urinary retention in 1.6% of patients (3/183). No patients developed anesthetic complications, UTI, or rectal bleeding.

**Conclusions:** Transitioning to a TP prostate biopsy approach is feasible and safe with overall PCa detection rate of 44% and a high rate of detection of clinically significant disease with 75% of positive biopsies being Grade Group 2 or higher. Given our favorable experience our center has migrated to a TP-only for all patients.

## Pain Management Protocol with Transversus Abdominis Plane Block, Gabapentin, Acetaminophen, and NSAIDs Results in Zero Outpatient Narcotic Use after Robotic Radical Prostatectomy

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**Introduction:** According to the CDC, almost 15,000 opioid-related deaths occurred in the United States in 2018 alone, accounting for 32% of all overdose deaths. Given that receiving an opioid prescription after surgery is associated with 43% increased odds of persistent use, we instituted a protocol to reduce narcotic use after robotic radical prostatectomy (RP).

**Methods:** Patients undergoing robotic RP received oral gabapentin 300 mg and acetaminophen (APAP) 975 mg in the holding area and 30 cc of 0.5% bupivacaine before port insertion with a transversus abdominis plane block under direct vision after camera insertion. Postoperatively, patients received the same oral medications and ketorolac 15 mg q6h standing. Oral narcotics were not used during admission. All patients were discharged on gabapentin 300 mg q8h, APAP 975mg q8h, and ibuprofen 400 mg q6h standing in the absence of contraindications. No narcotic prescriptions given after discharge. A 24-hour telephone number hotline was set to call with complaints of insufficient pain control. This study was approved by IRB.

**Results:** A total of 184 consecutive patients who underwent robotic RP were enrolled. Twenty percent (37/184) of patients received at least one dose of morphine sulfate in the hospital. No patients received narcotic prescriptions upon discharge and no patients called the hotline asking for stronger pain medications.

**Conclusions:** Our experience showed that no patients enrolled in the PENN Initiative received postoperative narcotic prescriptions compared to 100% of patients before institution of the protocol. Our study validates the utility of ERAS protocols to reduce narcotic use after surgery.