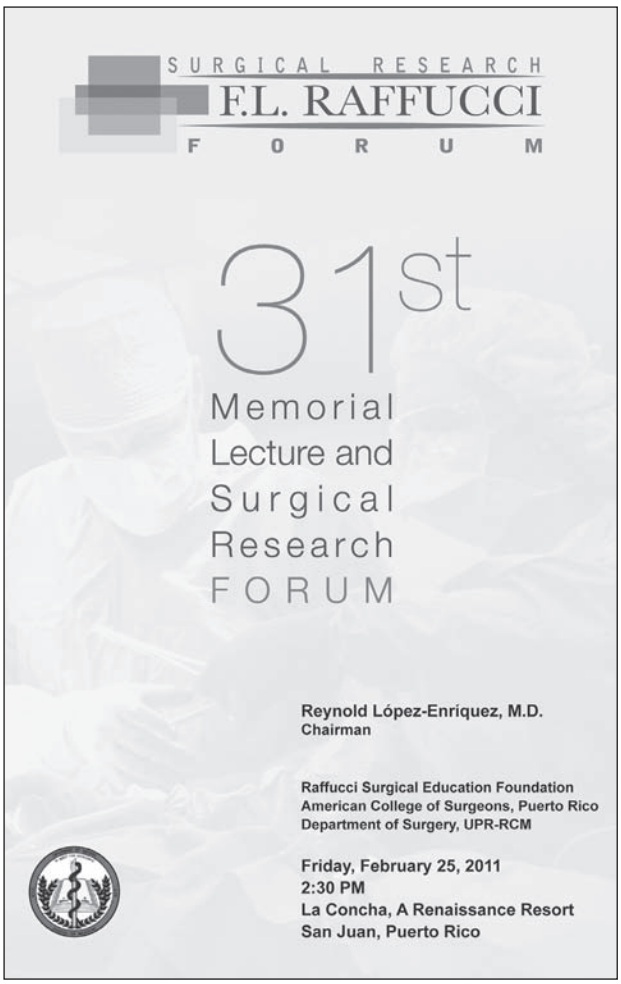

- **Inferior Petrosal Sinus Sampling for Cushing's Disease.**

  Rafael Rodríguez-Mercado; Amaury García; Erwin Rayo

  Endovascular Neurosurgery, Dept of Surgery and Endocrinology, Department of Internal Medicine, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

Purpose: Cushing's syndrome results from excessive exposure to the hormone cortisol. This disorder is most commonly caused by taking exogenous steroids over a long period of time. A less common form of this disorder occurs when the body itself produces an excessive amount of cortisol caused by microadenomas of the pituitary (Cushing's disease) in 60-80%, adrenal tumors in 10-20% and ectopic tumors of the lung or pancreas in 1-10%. Inferior Petrosal Sinus Sampling (IPSS) determines the most likely location (side) of a microadenoma within the pituitary gland, with a reported15% incorrect lateralization rate. Methods: A retrospective revision of the results of IPSS was done in four patients who presented with clinical evidence suggesting Cushing's disease during the 2008-2009 period. In the diagnostic evaluation of these four patients we proceeded with a corticotropin-relasing hormone (CRH) stimulation test following the established protocol for the IPSS venous sampling. Blood samples once taken were sent to a reference laboratory. Results: No complications were reported in the four patients that underwent the IPSS procedure. We established the diagnosis of Cushing's disease from a pituitary microadenoma secreting ACTH in three patients with lateralization. In one patient the IPSS venous sampling did not show a significantly increased ACTH level and this patient was later found to have an ectopic pancreatic lesion that was responsible for the Cushing's syndrome. The three patients with microadenomas that underwent surgery had satisfactory results. Conclusion: Inferior Petrosal Sinus Sampling in patients with Cushing's disease is an excellent tool for the diagnosis of pituitary microadenomas secreting ACTH. This procedure had a low morbidity and mortality but it requires a well-trained endovascular and endocrinology team to avoid mistakes in the collection of blood samples.

- **The Pattern of Breast Asymmetry in Women with Idiopathic Scoliosis.**

  Norma I. Cruz

  Plastic Surgery Division, Department of Surgery, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

Purpose: Women with idiopathic scoliosis are often observed to have breast asymmetry. Additionally, the accuracy of visual estimation of breast asymmetry may be impaired by the presence of rib cage deformity in these women. Methods: In an effort to better understand this asymmetrical feature, a clinical study was performed in which 140 women with idiopathic scoliosis, who presented for correction of breast asymmetry, were evaluated. Age, weight, height, type of scoliosis, Cobb angle, breast measurements, and weight of tissue removed to obtain breast symmetry, were recorded. The breast measurements included: 1) sternal notch to nipple, 2) mid-clavicle to nipple, and 3) nipple to inframmamary fold. Results: The mean age was 23±8, weight was 130±53 lbs., and height was 62±3 inches. A right convex thoracic curve occurred in 85% of the group, with a mean Cobb angle of 31±24 degrees. A left convex thoracic curve occurred in 15% of the group, with a mean Cobb angle of 35±21 degrees. Surgical correction of scoliosis had been performed during adolescence in all patients who had a Cobb angle over 40°. Patients with a right convex thoracic curve had a smaller right breast and patients with a left convex thoracic curve had a smaller left breast. The larger breast had measurements with a mean difference of 3±2 cm for the sternal notch to nipple distance, 3±3 cm for the mid-clavicle

to nipple distance, and 2±1 cm for the nipple to inframammary fold distance. The mean weight of breast tissue removed from the larger breast to obtain symmetry was 150±78 grams. All our patients with scoliosis had breast asymmetry, but there was no direct correlation between the degree of breast asymmetry and the Cobb angle. Conclusion: The breast asymmetry of women with scoliosis appears to follow a pattern in which the breast on the affected side is smaller. The final breast asymmetry is a combination of the imbalance of the hypoplastic breast with the normal opposite breast. If the normal breast has a large size the asymmetry appears to be more severe. On the other hand, in young women with small breasts little or no asymmetry might be noted.

- **Penetrating Inferior Vena Cava Injuries are Associated with Thromboembolic Complications.**

Fernando L. Joglar[1]; Palma Shaw[2]; Naomi Hamburg[3]; Robert Eberhardt[3]; Jeffrey Kalish[2]; Denis Rybin[4]; Gheorghe Doros[4]; Alik Farber[2]

[1]Department of Surgery, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; [2]Section of Vascular and Endovascular Surgery; [3]Section of Cardiovascular Medicine; [4]Biostatistics Department, Boston University Medical Center, Boston, Massachusetts

Purpose: Prior studies report that inferior vena cava (IVC) injuries have high mortality and may increase the rate of thromboembolic complications in survivors. We sought to define the effect of penetrating IVC injury on thromboembolism risk in a large, comprehensive, nationwide registry of trauma patients. Methods: We conducted a retrospective study with data obtained from the National Trauma Data Bank (NTDB). Patients 18-65 years of age who had penetrating abdominal trauma with laparotomy and IVC injury were identified by ICD-9 codes. As a comparison group we studied patients with penetrating abdominal injury and laparotomy without IVC injury. We excluded patients with previously diagnosed deep venous thrombosis (DVT), concomitant lower extremity vascular or skeletal injury, pelvic fracture, head trauma, or spinal cord injuries. Comparative analyses of demographics, injury severity characteristics, complications, and outcomes were performed. Results: We identified 374 cases of patients with penetrating IVC injuries and 7,081 cases with penetrating abdominal injuries without IVC injury among 1,309,311 patients in the dataset. IVC injury was associated more frequently with gunshot wounds (84.0% vs 50.3%, P = <.001). Patients with IVC injury presented with lower mean systolic blood pressure (SBP)(101.5±45.4 mmHg vs 124±34.3 mmHg, P < .001), higher mean injury severity scores (ISS) (25.0±13.3 vs 14.7±10.7, P < .001), and had longer mean ICU (6.9±11.7 vs 4.7±11.2 days, P = .001) and overall length of stays (LOS)(13.5±21.3 vs 11.5±16.3 days, P = .021). In IVC injury patients, the incidence of DVT was 4.0% vs 1.9% (P=.003) in the comparison group. The unadjusted mortality was 49.7% for the IVC injury group vs 8.2% in the non-IVC injury group (P < .001). On multivariate analysis, patients with IVC injury had a higher risk of DVT 2.13 OR (95% CI 1.17, 3.87, P = .014) and a higher risk of death 7.65 OR (95% CI 5.69, 10.3, P < .0001). Conclusion: Patients with IVC injury have a higher risk of DVT than those with penetrating intra-abdominal injury alone. Penetrating IVC injury is associated with increased injury severity and mortality. Our findings emphasize the importance of developing surveillance and prevention strategies to reduce the rate of venous thromboembolism in patients with IVC injury.

- **Diabetes Mellitus as a Risk Factor for Prostate Cancer Progression after Radical Prostatectomy.**

Lourdes Guerrios[1]; Stephen Freedland[2]; Margarita Irizarry[1]; Cynthia Pérez[3]

[1]School of Medicine and Health Professions, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; [2]Urology Department, Duke University; [3]Epidemiology Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

Purpose: Hyperparathyroidism is a condition where the parathyroid glands secrete excess of Parathyroid Hormone (PTH) which consequently leads to hypercalcemia. Primary Hyperparathyroidism is usually caused by a single adenoma at one of the parathyroid glands. The main treatment for this condition is surgery, where the parathyroid adenoma is localized and removed. In the era of minimally invasive procedures there has been multiple techniques developed to localize the adenoma before and during surgery. One of these techniques is Parathyroid Radioguided Surgery. This study evaluates the experience at the Oncologic Hospital Dr. Isaac Gonzalez Martinez using the Parathyroid Radioguided technique. Methods: Among 44 patients that underwent Parathyroid Radioguided Surgery from 2001 to 2009, a total of 43 patients were included in our study. This technique requires pre surgery injection of radioisotope and intra-operative localization of the adenoma using a Gamma Probe. This surgery took an average of 47 minutes (15min – 90 min). Serum calcium levels of participating patients were recorded before and after surgery (up to 24hrs). Results: Our results showed that 98% (42/43) of the evaluated patients had a significant (p < 0.001) decrease in serum calcium levels after the radioguided surgery. Also, 95.35% (41/43) of the specimens removed were reported by pathologist as parathyroid adenoma. Only 5% (2/43) of the patients showed hyperparathyroidism recurrence and were re-explored. Conclusion: The Parathyroid Radioguided Surgery using

the Gamma probe identified the parathyroid adenoma in most of the treated patients. With this minimally invasive surgery a high successful rate was observed suggesting that this technique can be an effective treatment for Primary Hyperparathyroidism.

- **Traumatic Brain and Spinal Cord Injuries during Infancy and Early Childhood in Puerto Rico.**

  Ingrid Rodríguez-Rivera; Yaritza Acevedo; Idania Rodríguez-Ayuso; Enid García; Ricardo Brau
  Neurosurgery Section, School of Medicine; College of Health Professions, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; Instituto de Estadísticas de Puerto Rico

Purpose: Traumatic brain and spinal injury are leading causes of death and disability among adults as well as children in the United States. The most common mechanisms of injury are motor vehicle crashes and falls. For the pediatric population the mechanisms of injury vary by age group. This study aims to describe the demographic characteristics, mechanisms of injury, circumstances associated with the injury, severity of injury and type of traumatic brain and spinal cord injuries for pediatric patients from 0 to 4 years old. This study will focus only in pediatric patients aged 0 to 4 years of age, differing from others that take into consideration the whole spectrum of the pediatric age groups. Methods: We performed a descriptive study through secondary data analysis of 110 cases meeting inclusion criteria, from a database containing data from 2,788 patients, all ages, with neurological traumatic injuries evaluated by the Neurological Surgery service at the Emergency Room of the Puerto Rico Medical Center in San Juan, Puerto Rico from January 1, 2007 to July 31, 2008. SPSS 18 was used for statistical analysis. Results: The mean age was 1.7 years, 30% of the males were 1 year old and 30% of the females were 2 years old. Males constituted 69% of the sample and females 31%. The most frequent day of the week in which injury events took place was Wednesday (18.7%), home (76%) was the most frequent place of occurrence, and 48% of the children were under the care of their mother or both parents (47%). The most common mechanism of injury was falls from a higher level (74%). The range of height found in this study is between 1 and 15 feet, the mean was 4.4 feet and the median 3 feet. Fall from the same height (13%) is the second most frequent mechanism. The third most frequent mechanism is a transport related event (10%). Traumatic brain injury (TBI) was present in 66% of the cases, 33% had both types of trauma and only 1% had spinal cord injury (SCI). Of the cases presenting with TBI 95% were mildly severe according to the Glasgow coma scale (GCS) and 5% were moderately severe. The most common injury was skull fracture (72.4%), followed by contusion (17.1%) and epidural hematoma (10.5%). Conclusion: Mild TBI occurs most often in patients less than 2 years old; males, at the care of mother or both parents; due to a fall from another level.

- **Pretreatment Thrombocytosis in Breast Cancer Patients.**

  J. Axtmayer[1]; C. Cruz[2]; C. Castro[3]; B. Suárez[4]; O. Frías[5]; A.P. Ortiz[5,6]; J. Romaguera[7]; E. Mora[3,4,8]
  [1]Department of Biology, Mayagüez Campus, University of Puerto Rico, San Juan, Puerto Rico; [2]Clinical Trials Program, UPR Comprehensive Cancer Center, [3]Department of Surgery, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; [4]Cancer Biology Laboratory, Department of Surgery, School of Medicine, University of Puerto Rico, San Juan, Puerto Rico; [5]Cancer Control and Population Sciences Program, University of Puerto Rico Comprehensive Cancer Center; [6]Department of Biostatistics and Epidemiology, Graduate School of Public Health, University of Puerto Rico, San Juan, Puerto Rico; [7]Department of Gynecology, School of Medicine, University of Puerto Rico, San Juan, Puerto Rico; [8]Section of Surgical Oncology, U.T.M.D. Anderson Cancer Center

Purpose: Breast cancer is the most common female malignancy in Puerto Rico. Recent statistics showed that from 2000 to 2004 the mortality due to breast cancer has not changed despite advancements in treatment modalities. This observation lead us to postulate that patient's factors might influence the mortality rate independently of treatment factors. One of those factors that had not been widely studied is the number of platelets at the time of diagnosis. Platelets are known to participate in the development and progression of cancer. The proposed mechanisms portrait platelets as indirect mediators of tumor growth and progression. However, recent advances in platelet's physiology showed that platelets can contribute directly to tumor development and metastases through secretion of several factors (Vascular Endothelial Growth Factor, Interleukin 6) and regulation of tumor angiogenesis. In fact, thrombocytosis (> 400,000) had been correlated with decreased overall survival in patients with different types of cancers. Based on this information we hypothesize that thrombocytosis correlate with the worst prognostic factors in breast cancer patients. Methods: This cross-sectional study analyzed data from female patients with breast cancer diagnosed between 2000 and 2005 at the I. González-Martínez Hospital (IGM) in San Juan, Puerto Rico. Information on platelet counts at the time of diagnosis and other clinical variables were retrieved from the hospital's cancer registry and from medical record review. Thrombocytosis was defined as a platelet count over 400,000/ml of blood. This study was

approved by the Institutional Review Boards of the IGM Hospital and the Medical Sciences Campus of the UPR. Data was analyzed using the GraphPad software. Significance was evaluated using the Fisher test for categorical data and the Student-T test for continuous data. Results: A total of 240 patients were included in this study. The prevalence of thrombocytosis was 10%. The mean platelet count in the non-thrombocytosis group (NTG) was 272,000 ± 59.7 compared to 453,500 ± 58.9 in the thrombocytosis group (TG). The distribution of cases by clinical staging was: I- 78 (32.5%), II- 128 (53.3%), III- 22 (9.2%), IV-3 (1.25%), unknown- 9 (3.75%). Univariate analysis of the expression of tumor markers showed that expression of estrogen receptor correlates with thrombocytosis (p=0.0034). However, there was no correlation between thrombocytosis and progesterone (p=0.4935) or Her-2 expression (p=0.1242). There was no statistical difference between the age of patients in the NTG (63.51 ± 12.96; 36-94) and the TG (61.75 ± 13.09; 30-87; p= 0.4371). In addition, there was no correlation between thrombocytosis and clinical staging (p= 0.5737). Conclusion: The results of this study suggest that thombocytosis correlates with estrogen receptor expression in breast tumors. Whether thrombocytosis correlates with overall survival will be the focus of our next analysis.

- **Thyroid Disease of Surgical Significance in the Pediatric Patient.**

  Jorge J. Zequeira[1]; Carmen T. Ramos[2]; William Méndez-Latalladi[1]

  [1]Department of Surgery, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico, [2]Department of Surgery, Miami Children's Hospital, Miami, Florida

Purpose: The Puerto Rico Department of Health has scarce data pertaining to pediatric thyroid disease. We aim to discuss our surgical experience with pediatric thyroid diseases at two institutions. Methods: An institutional review board approved retrospective analysis of clinical data of patients less than 19 years of age undergoing thyroid surgery at two institutions from 2007-2010 was performed. Results: Our cohort consists of 12 patients on whom 13 procedures were performed. Eight (62%) of the procedures were performed on females and 5 (38%) on males. Age ranged from 11-19 years with a mean age of 17 years. Table 1 describes the diagnoses and procedures performed. Operative and length of stay data are depicted in Table 2. There were no cases of recurrent laryngeal nerve injury. One patient developed transient hypocalcemia. Conclusion: Thyroid surgery in pediatric patients is safe for benign and malignant disease with minimal complications. Further prospective epidemiological and outcome studies are needed in this population.

Table 1. Benign and Malignant diagnoses and procedures

	Diagnoses	%	Procedures
Benign disease	Benign nodules*	50%	Thyroid lobectomy (4), Total thyroidectomy (1)
	Grave's disease	40%	Total thyroidectomy (4)
	Multinodular Goiter	10%	Total thyroidectomy (1)
Malignant disease	Papillary thyroid cancer	50%	Thyroid lobectomy (1), Completion thyroidectomy (1)
	Metastatic papillary thyroid cancer	25%	Bilateral modified radical neck dissection (1)
	Follicular cancer	25%	Thyroid lobectomy (1)

*Hyperplastic nodule, toxic adenoma, follicular adenomas

Table 2. Operative and length of stay data

	Total thyroidectomy (5)	Bilateral MRND (1)	Thyroid lobectomy (7)
Length of stay (days)	2.6 (1-5)	2	0.57 (0-2)
Estimated blood loss (ml)	140 (50-250)	50	26.4 (20-50)
Operative time (mins)	175 (120-280)	180	77.14 (55-115)

- **The Prevalence of Metabolic Syndrome in a Hispanic Renal Transplant Population**.

  C. Álvarez-Allende; Z. González-Caraballo; E.A. Santiago-Delpín; C. Suárez; P. Hernández; C. Del Coro-Amengual; L. Morales-Otero

  Puerto Rico Renal Transplant Program, Auxilio Mutuo Hospital; School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

Purpose: Metabolic Syndrome (MetS) is one of the most common long-term complications of transplanted patients with its predisposition to diabetes mellitus and cardiovascular disease. Cardiovascular disease is the most common cause of long term mortality contributing to 47% of the deaths of transplant patients. MetS has also been associated with decreased kidney graft survival when compared to transplant patients without the syndrome. Management of MetS has become a must for this set of patients to improve long term survival of the patients and grafts. In an Asian transplanted population the prevalence of MetS was 43.3% overall, 39.4% males, 54.7% females. Prevalence in the first six months is 4.5%, but after five years it increases to 41.3%. Others report a lower incidence. The purpose of this study was to establish the incidence and prevalence of MetS in pre-transplant and renal transplant Hispanic patients. We do not know of any study about Hispanic populations and the incidence of MetS. Methods: In this retrospective descriptive study all cases of renal transplantation at the Puerto Rico Renal Transplant Program were reviewed between 2006 and 2010 for a total of 400 cases. Patients with diabetes mellitus

prior to the transplant were excluded from this study. Deceased patients and patients with graft failure were also excluded from this part of the study. A total of 180 cases were included in this study. Information was collected on the patient's body mass index (BMI), triglycerides, HDL, LDL, blood pressure, blood glucose levels and creatinine at the time of the transplant and at 6, 12 and 36 months. The prevalence of MetS was established using the National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATPIII) criteria. BMI instead of waist circumference was used to determine obesity in this case since in end-stage renal disease (ESRD) and kidney transplant patients, since the BMI seems to be a better predicting factor of obesity for MetS. Three out of the six defining criteria established the diagnosis of MetS. Results: Using the NCEP-ATPIII criteria MetS was diagnosed in 70 of 180 patients (38.8%), 47 out of 107 males (43.9%) and 23 of 73 females (31.5%) for a period covering from 2006 to 2010. Mean age for patients with MetS was 46 years (SD ± 16 years). In the pre-transplant list for 2009, MetS was found in 31 of 118 patients (26%). At the time of transplantation 56 out of 180 patients (31.1%) were diagnosed with MetS with new cases post-transplantation at incidence rates of 3.3%, 4.4% and 1.1% at 6, 12 and 36 months post-transplant respectively. Conclusion: In this series, the prevalence of MetS is relatively high. There is no significant difference between males and females with Metabolic Syndrome. (p=0.09) A higher incidence rate of the syndrome was observed in patients at 12 months post-transplantation. MetS seems to be already present before transplantation in our population.

- **Blood Pressure Outcomes after Adrenalectomy in Patients with Functioning Adrenal Tumors**.

  William Méndez; Cesar Luque; Guillermo Rivera; Jorge Zequeira
  Department of Surgery, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

Purpose: The purpose of our study was to evaluate outcomes regarding blood pressure (BP) parameters and use of antihypertensives (AHTN) after adrenalectomy (ADR) in patients with functional adrenal tumors (FAT). Methods: A retrospective study was performed using a prospective database of patients who underwent ADR at the University of Puerto Rico from 2007 to 2010. Inclusive criteria were a diagnosis of FAT and at least 3 month follow-up. Cure was defined as a postoperative BP < 140/90 mmHg and using no AHTN. Patients with BP > 140/90 mmHg or using AHTN were considered non-cured. Tumors were classified as hypercortisolism (HC), pheochromocytoma (PHE) or hyperaldosteronism (HA). Statistical analysis comparing pre and postoperative BP parameters and use of AHTN was made for each type of tumor. Comparison between cured and non-cured patients was made for age, gender genetics, BMI and duration of disease. P value of <0.001 was considered statistically significant. Results: Twenty-nine ADR were performed in 26 patients during the study period. Twenty one patients with 23 ADR were included. Mean age was 48 y/o (24-67). Mean follow-up was 20 months (3-34). There were 11 males and 10 females. A posterior laparoscopic ADR was done for 16 patients, 2 patients with bilateral disease had cortical sparing ADR using an open anterior approach, and 3 patients had open posterior approach. There were 2 HC, 10 HA and 9 PHE. There were 4 MEN IIa patients in the PHE group. All patients with HC and PHE were cured after surgery. 90% of patients with HA were non-cured after surgery; however postoperative decrease in systolic and diastolic blood pressure and number of AHTN was significant. There were no significant differences between the tumor types in terms of age, gender, BMI or tumor size. Regarding duration of disease, the cured patients group had an average of 13 months vs. 42 months in the non-cured group and that was statistically significant. There was a mean of 40 months for HA group, 14 months for HC and 11.6 months for PHE and that was also significant. Conclusion: All BP parameters and number of AHTN were significantly reduced in patients with FAT after ADR. Patients with HC and PHE achieved lower BP parameters and use of AHTN than patients with HA. Shorter duration of disease prior to surgery seems to correlate with the rate of cured patients.

- **Glaucoma Valves in Pediatric Patients of Puerto Rican Ancestry: A Two Year Retrospective Non-Randomized, Comparative Study of Baerveldt and Ahmed Valves**.

  José M. García-González, MD; Betsy Colón, MD; Ricardo Rodríguez-Rosa, MD
  Ophthalmology Department, School of Medicine, University of Puerto Rico, San Juan, Puerto Rico

Purpose: The effectiveness of aqueous drainage devices (ADD) in Puerto Rican pediatric glaucoma patients has not been well studied. In order to better understand how to manage this particular population, a retrospective study was performed that compared aqueous drainage devices Ahmed (FP-7 and S-2) and Baerveldt 350 mm^2, in their control of intraocular pressure (IOP) in pediatric glaucoma patients of Puerto Rican ancestry. Methods: A retrospective chart review was done in which valve implant patients' records from a private office and resident clinics were evaluated. Inclusion criteria consisted of completion of a minimum of 18 months of follow-up after valve placement. All patients were under 20 years of age. Types of glaucoma were congenital, aphakic, and uveitic. Eighteen eyes with 19 valves were included in the review. In the study group we had 12 Ahmed and 7 Baerveldt valves. All patients had valves placed by one surgeon. The criterion for success was defined as IOP 6-21 mmHg with or without glaucoma medications. Results: Ahmed eyes had a statistically

significant (p=0.010) greater probability of maintaining optimum IOP when compared to Baerveldt eyes. Cumulative probability of success at 18 months for Ahmed and Baerveldt was 90 % and 73 %, at 21 months 86% and 59% respectively. No statistically significant difference on average IOP was observed when Ahmed models were compared. At 24 months 1.75 more IOP medications were in use by Baerveldt eyes when compared to Ahmed eyes. On comparing Baerveldt valves in aphakic and congenital glaucoma, a statistically significant (p= 0.015) trend emerged where congenital glaucoma had, on average, a lower IOP. Conclusion: Ahmed eyes had a statistically significant greater probability of maintaining optimal IOP when compared to Baerveldt eyes at 21 months. We believe this to be the first ADD study performed exclusively for Latin children.

- **Internal Jugular Approach for Catheter Directed Thrombolysis during Treatment of Proximal Deep Venous Thrombosis**.

R. Figueroa-Vicenty; Y. Muñoz, L. Torruella, J.L. Martínez-Trabal

Ponce School of Medicine, Caribbean Vascular Center, Instituto Vascular del Sur, Ponce, Puerto Rico

Purpose: It is recognized by expert consensus guidelines (8th ACCP Guidelines) that proximal (Ilio-Femoral) deep venous thrombosis (DVT) should be treated with catheter directed thrombolysis (CDT) to avoid the severe postphlebetic syndrome that will be present when treated with systemic anticoagulation alone. The most common approach for venous access described in the scientific literature is through the ipsilateral popliteal vein using ultrasound guidance. Our preferred approach is rarely used by others and not yet described in literature. This approach is avoided due to the presence of valves in the lower extremity venous system, that makes it technically challenging and there is the potential risk of mechanical damage to the valves. Our purpose is to evaluate the results and usefulness of CDT for the treatment of proximal DVT using the internal jugular vein approach. Methods: All patients treated with CDT at a local hospital in the south side of Puerto Rico, were placed in a registry. Data that was collected and analyzed, and included demographics, thrombus burden and location, days since onset of symptoms, catheter entry site, hospital length of stay (LOS), ICU LOS, treatment time, r-TPA dose, the use of adjuncts, etiology, thrombus resolution, and complications. Results: Twenty patients with a gender distribution of 12 females and 8 males were evaluated. They had an average age of 45 years. All patients had involvement of the iliofemoral segment and 5 had inferior vena cava involvement. Approach or entry site was the internal jugular vein in most patients, with only 4 (20%) of the patients using the ipsilateral popliteal vein. Thrombus resolution average 96%. Follow-up venous duplex studies showed evidence of valvular insufficiency in 4 (20%) of the patients, with 33% of patients having acute or chronic DVT at the time of completion venography. Complications included >15% drop in hemoglobin in near 60% of patients, one patient with IVC filter embolization, one patient with popliteal fossa hematoma, and one patient with pulmonary failure. There were no major bleeding complications. Conclusion: Catheter directed thrombolysis continues to provide a safe and effective strategy for prompt thrombus removal and avoids postphlebetic morbidity. The results of CDT using the internal jugular approach are very similar, in terms of lytic success and complication rates when compared to other series. The observed presence of valvular insufficiency in follow-up venous duplex studies is most likely related to chronic DVT and primary valvular incompetence. Mechanical injury to the venous valves secondary to the use of a retrograde approach through the internal jugular vein does not result in chronic valvular insufficiency. The jugular vein approach is safe, effective and our initial experience shows lack of mechanical damage to valves using a retrograde technique.