27TH Memorial Lecture and Surgical Research Forum Abstracts

TWENTY-SEVENTH F.L. RAFFUCCI HONORED LECTURE

A-1 Patient Satisfaction with Breast Reshaping after Massive Weight Loss

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Introduction: Massive weight loss affects breast shape, projection and skin elasticity unfavorably. In most of these patients the loss of fat is profound, leaving an inadequately filled skin sack. Some patients, however, remain with an excessive breast volume which, coupled with severe ptosis, produces back and shoulder pain. The Pittsburgh rating scale, which is used to classify contour deformities after bariatric weight loss, established a four point grading system to rate the severity of the breast deformity. In this scale "0" indicates normal, "1" indicates ptosis grade I/II or severe macromastia, "2" indicates ptosis grade III or moderate volume loss, and "3" indicates severe lateral roll and/or severe volume loss with loose skin.

Method: Patient satisfaction with breast reshaping after massive weight loss was evaluated. Sixty women participated in the study. Using the Pittsburgh rating scale each patient was classified by her preoperative breast deformity into one of three groups (scores of 1 to 3). Patient information recorded included age, body mass index, amount of weight loss and type of breast surgery. Six months postoperatively, each patient was given a self-administered questionnaire in which she was asked to rate her satisfaction with the breast size, breast shape, breast symmetry, scars, aesthetic results, and overall satisfaction. Ratings were made on a scale of 1 to 10, with 10 being the best. Group 1 (Pittsburgh score of 1) had 19 patients, group 2 (Pittsburgh score of 2) had 23 patients and group 3 (Pittsburgh score of 3) had 16 patients.

Results: There was no significant difference ($p>0.05$) among the three groups in mean age (33±11 vs. 30±14 vs. 29±10) or body mass index (31±4 vs. 30±3 vs. 32±3). The mean weight loss was 90±18 lbs for group 1, 119±27 for group 2 and 197±31 for group 3. Regarding the type of surgery we found that patients in group 1 had traditional mastopexy, reduction or augmentation; group 2 patients had traditional mastopexy with or without augmentation; group 3 patients had parenchymal reshaping with dermal suspension and autoaugmentation, or implants. Significant differences ($p<0.05$) in patient satisfaction were found in group 3, with lower scores given for scars, aesthetic results and overall satisfaction (Table 1).

Table 1. Ratings of postoperative patient satisfaction (mean values ± standard deviation)

	Group 1 (n=19)	Group 2 (n=23)	Group 3 (n=16)	*P*
Breast size	8±2	7±3	8±1	$p>0.05$
Breast shape	7±2	6±3	6±2	$p>0.05$
Symmetry	8±1	8±2	7±2	$p>0.05$
Scars	7±2	7±3	4±2	$p<0.05$
Aesthetic results	7±1	7±2	4±3	$p<0.05$
Overall satisfaction	7±3	7±3	5±2	$p<0.05$

Conclusion: When performing breast reshaping after weight loss, patients with a Pittsburgh score of 1 or 2 are satisfied with the outcome of surgery, but those with a Pittsburgh score of 3 are dissatisfied with the extensive scars and poor aesthetic results. Surgeons should be aware that these patients have unrealistically high aesthetic expectations.

A-2 Long-Term Outcome of Patients with Elevated PTH following Intraoperative Parathormone Guided Parathyroidectomy

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Introduction: Elevated parathormone levels (ePTH) have been reported in up to 40% of eucalcemic patients after parathyroidectomy, for sporadic primary hyperparathyroidism but its long-term clinical significance remains unclear. This biochemical finding of an elevated hormone level may be a predictor of recurrent hyperparathyroidism (HPT). The goal of this study is to describe the outcome of eucalcemic patients that were found to have ePTH during the follow-up period after successful parathyroidectomy.

Methods: 576 patients with primary sporadic hyperparathyroidism underwent parathyroidectomy guided by intraoperative parathormone monitoring (IPM). Operative success was defined as eucalcemia ≥6 months and recurrent HPT as hypercalcemia and ePTH after successful parathyroidectomy. Patients were considered to have ePTH when PTH levels were >70 pg/ml at anytime during the follow-up period. All data were collected prospectively and retrospectively reviewed. When possible, all patients were followed at yearly intervals with serum calcium and PTH levels for an average of 44 months (range, 6 to 181).

Results: 559/576 (97%) patients underwent successful parathyroidectomy. 391/559 (70%) had consistently normal PTH and calcium levels and 168/559 (30%) patients had ePTH with an average follow-up of 43 months. Of the entire group of 559 patients, 7(1.3%) developed recurrent disease at a mean follow-up of 63 months (range, 24 to 120). Of the 168 patients with ePTH, 107 were followed more than 2 years and 7/107 (7%) developed recurrent hyperparathyroidism.

Conclusion: Thirty percent of patients will show

variable ePTH levels after successful parathyroidectomy. The majority (93%) of patients with ePTH will remain eucalcemic when followed long-term but 7% may develop recurrent hyperparathyroidism after two postoperative years. Patients with eucalcemic ePTH need to be closely monitored for an extended period after successful parathyroidectomy.

A-3 JAK-2 Mediates the Interleukin-3 Dependent Growth of Bone-Metastatic Breast Carcinoma Cells

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Introduction: Bone is one of the most common sites of metastatic disease of breast carcinoma. Signs and symptoms include bone pain and fractures, representing great morbidity to patients. At present, a cure has not been found and the only treatment we have to offer patients is palliative. The mechanisms by which breast cancer cells from the primary tumor migrate and grow in bone are mostly unknown. Our laboratory had previously found that Interleukin-3 (IL-3) is an important mediator of the selective growth of these cells in the bone marrow. Furthermore, we found that bone- metastatic, but not lung- or pleural-metastatic breast cancer cells overexpress the IL-3 receptor. These findings suggest that the intracellular mechanisms activated by IL-3 might become a target for new therapeutic strategies. IL-3 induces the growth of hematopoietic cells using the Jak-2-Stat5 mechanism. Based on these findings we hypothesize that IL-3 mediates the growth of bone metastatic breast carcinoma cells (MDA-231) using the Jak-Stat pathway.

Method: To test this hypothesis bone-metastatic breast carcinoma cells (MDA 231-bone) were exposed to 150 ng/ml of IL-3 for different time points (6, 12, 24, 48 hrs). Using immunoblotting techniques, phosphorylated (pJak-2 T221, pJak-2 T1007/1008, pStat-5 T694) and non-phosphorylated (Jak-2, Stat-5) proteins were detected. The results were quantified using the Innotech Imager.

Results: We found that IL-3 increases the early (6 hr) expression of pJak-2 T221, but not pJak-2 T1007/1008. Jak-2 increased after 24 hours of exposure to IL-3. There were no changes in either STAT5 or pSTAT5.

Conclusion: These results indicate that *early* Jak-2 phosphorylation is one mechanism by which IL-3 induced the growth of bone-metastatic breast carcinoma cells. Future studies will assess whether inhibition of Jak-2 alone abolishes the growth of bone-metastatic cells. If so, new target therapy for bone-metastatic disease could be developed using inhibitors of JAK-2.

A-4 Dynamic Retention Suture Closure: Modified Bogotá Bag Approach

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Introduction: Management of patients with Abdominal Compartment Syndrome requires abdominal decompression and the use of the open abdomen technique. Various options exist for the management of the open abdomen including expensive, commercially available devices to aid in the gradual closure of the abdominal wall. A previously described temporary closure technique using dynamic retention sutures was modified and used in eleven trauma injured patients at the Puerto Rico Trauma Center.

Method: A retrospective study was made of eleven trauma patients, 7 blunt and 4 penetrating, who were treated at the Puerto Rico Trauma Center with the Modified Bogotá Bag (MBB) approach during the period October 2005 to November 2006.

Results: The MBB approach was applied to eleven out of forty-three trauma patients (26%) who had undergone a Bogotá Bag closure during initial damage control surgery. Patients' average age was 27.5 (2- 65) years old, 8 males and 3 females, with an Injury Severity Score (ISS) of 23.3 (9- 38). The MBB placement allowed serial approximation in the Trauma ICU with subsequent delayed primary abdominal closure. The procedure was used for an average of 7.3 (4- 12) days. Abdominal closure was achieved in ten out of eleven patients (91%). Two of these patients were re-opened due to complications unrelated to the closure. They were then treated by means of conventional management using Vicryl mesh placement and skin grafting.

Conclusion: The MBB technique has preliminarily proved to be effective, allowing delayed primary closure in 91% of the cases. The MBB approach represents an inexpensive and useful alternative in the management of the open abdomen.

A-5 Head and Neck Skin Cancer: The Plastic Surgery Service Experience

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Introduction: Skin cancers are the most common cancers in the United States and Puerto Rico, comprising 50% of all cancers diagnosed every year. The incidence is rising dramatically due to an aging population and thinning of the atmospheric ozone layer which permits greater penetration of ultraviolet radiation.

Method: In an effort to evaluate the current incidence, types, and locations of skin cancer of the head and neck in an aging population, data was collected from the Plastic Surgery Service of the VA Caribbean Healthcare System. This service receives all malignant skin lesions located in the head and neck area for management. The data recorded for the cases managed during the past seven years (January 1999 to December 2005) includes the type of cancer, its location, age of patient, the surgical procedure, and date of surgery. All information was analyzed using the statistical software program Statistical Package for Social Sciences.

Results: A total of 552 cases of skin cancer, an average of 79 cases per year, underwent surgical management during the seven years of study. The mean age of the patients was 74±9 years. The most frequent type of skin cancer was basal cell carcinoma, present in 86% of the cases. Squamous cell carcinomas were reported in 13%, and melanomas in 1% of the cases. Skin cancer was located in the nose in 30% of the patients and in the cheek in 29%. The table shows the percentage of skin cancers in different areas of the head and neck.

Nose	Cheek	Ears	Forehead	Periorbital	Lip skin	Chin	Scalp	Neck	Vermilion
30%	29%	13%	12%	6%	3%	3%	2%	1%	1%

Conclusion: Hispanics historically have been reported to have a lower risk of skin cancer than fair-skinned persons because of the protection to the skin provided by melanin. Of the estimated population served by the VA hospital (65,983) about 79 cases per year require surgical management of skin cancer. The incidence of skin cancer in this elderly Hispanic population is therefore at least 120 in 100,000. This figure is somewhat lower than that reported for whites in the US of 233 in 100,000, but significantly higher than that reported for blacks in the U.S. of 3.4 in 100,000. The types of skin cancer and the locations of the lesions are similar to that reported in the world literature.

A-6 Radical Lymphadenectomy and Rectus Abdominis Myocutaneous Flap for the Treatment of Bulky Groin Metastatic Penile Carcinoma

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Introduction: Carcinoma of the penis usually starts as an epidermoid tumor of the glans. Survival depends primarily on the status of the lymph nodes. Destruction of the inguinal groin area from metastatic adenopathy in advanced penile carcinomas can create large defects. En-block skin removal with node dissection and reconstruction using an advance myocutaneous flap has been described. We reviewed our experience with reconstruction of the inguinal region using a rectus abdominis myocutaneous flap in patients not previously radiated, and their current results.

Method: A retrospective analysis of all cases performed at our institution between August 2002 and August 2006 was performed. Six patients with penile carcinoma and inguinal metastasis underwent radical lymphadenectomy. In order to achieve tumor control, resection of the bulky tumor mass was performed and the defect closed using rectus abdominis myocutaneous flap reconstruction in all cases. Complications were defined as minor (wound infection, lymphocele, seroma, skin sloughing) and major (deep venous thrombosis, tumor recurrence in the flap, skin edge necrosis, flap necrosis and lower extremity lymphedema).

Results: Patients with inguinal node metastasis from penile cancer underwent lymph node dissection and reconstruction. Mean patient age was 67. Length of hospital stay was 16 days. No medical complications were found except for one patient with diarrhea. Using a rectus abdominis myocutaneous flap, primary closure of large skin defects was obtained in all cases. All patients were discharged with a viable flap and good esthetic results. No mortality from the procedure occurred. Minor complications such as seromas (1 patient) and wound infections (1 patient) were found. Late complications included recurrence at the flap skin edge (1 patient) and lower extremity lymphedema (1 patient).

Conclusion: Bulky disease at the inguinal region from metastatic penile carcinoma can be treated successfully by means of wide surgical resection and primary skin closure using a rectus abdominis flap. In comparison with other types of flaps, this procedure achieves good cosmetic results with low morbidity and significant improvement in quality of life.

A-7 Open Tibia Fractures: Does Timing of Surgery Affect Their Outcome?

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Introduction: The purpose of this study was to determine whether a delay from time of injury to the time of surgical management (debridement and fixation) influences the rate of acute infection at the site of an open tibial shaft fracture.

Method: A retrospective chart review was done which

identified 241 adult patients who had an open tibial shaft fracture treated at the Puerto Rico Medical Center between 1994 and 2005. Inclusion criteria encompassed all types of fractures under the Gustilo and Anderson classification (Table 1) regardless of the mechanism of trauma. Data obtained included age of the patient at the time of injury, sex, mechanism of trauma, type of open fracture, associated injuries, type of trauma, date of accident, date antibiotics started, date of surgical debridement, type of fixation, soft tissue coverage, complications, and date of union.

Table 1.

Open fracture type	Characteristics
Type I	Clean wound smaller than 1 cm in diameter, simple fracture pattern, no skin crushing.
Type II	A laceration larger than 1 cm but without significant soft tissue crushing, including no flaps, degloving, or contusion. Fracture pattern may be more complex.
Type III	An open segmental fracture or a single fracture with extensive soft tissue injury. Also included are injuries older than 8 hours.

Results:

Table 2

Distribution of Open Fractures According to Surgical Delay and Type of Open Wound

	Number of Fractures			
Surgical Delay (hrs)	**Type I**	**Type II**	**Type III**	**Total**
0-24	9	20	9	38
25-48	21	43	17	81
49-72	14	24	5	43
>73	28	41	10	79
Total	**72**	**128**	**41**	**241**

Table 3

Rate of Infection According to Time to Debridement and Type of Wound
Rate of Infection

Surgical Delay (hrs)	Type I	Type II	Type III	Total
0-24	0%(0 of 9)	10%(2 of 20)	11%(1 of 9)	8%(3 of 38)
25-48	19%(4 of 21)	19%(8 of 43)	29%(5 of 17)	21%(17 of 81)
49-72	14%(2 of 14)	12%(3 of 24)	20%(1 of 5)	14%(6 of 43)
>72	11%(3 of 28)	17%(7 of 41)	30%(3 of 10)	16%(13 of 79)
Total	**12%(9 of 72)**	**16%(20 of 128)**	**24%(10 of 41)**	**16%(39 of 241)**

Conclusion: In adults who had open tibia fractures, the rates of acute infection and nonunion were similar regardless of the time to surgical debridement after 24 hours, mean 71 hours. Surgical delay greater than 24 hours proved to be detrimental to all fracture types; the rate of infection increased to at least 20%, progressively worsening as more tibia was exposed.

A-8 Factors that Cause a Difference in Functional and Clinical Outcome of Elbow Contracture Releases in Patients with Periarticular Elbow Fractures

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Introduction: No prior study has compared the outcome of contracture release of periarticular elbow fractures. The purpose of this study is to assess the functional and clinical outcome of these patients after release and describe the factors that could influence the outcome.

Method: We retrospectively reviewed the outcome of 37 patients who had elbow contracture release performed by a senior surgeon (F.L.) during 1999-2005. Patients included in the study had either supra-intercondylar humerus fractures, Monteggia fracture-dislocations, terrible triads, radial head fracture dislocations or elbow dislocations as initial trauma. Patients were followed for 1 year and Mayo Elbow Performance Scores were obtained.

Mayo Elbow Performance Score (# of Patients)

	Excellent	Good	Fair	Poor
SUPRA-INTERCONDYLAR	3	4	3	4
MONTEGGIA	1	2	3	1
RADIAL HEAD FRACTURE/DISLOCATION	1	0	3	0
TERRIBLE TRIAD	2	2	1	3
ELBOW DISLOCATION	0	0	2	2

Results :The mean preoperative flexion-extension arc of motion for supra-intercondylar fractures was 30 degrees and after release was 54 degrees (**p<0.031**). The mean preoperative arc of motion for rotation of radial head fracture-dislocations was 5 degrees and after release 118 degrees (**p= 0.006**). The elbow dislocations group did not have significant improvement in arc of motion (**p=0.547**). Taking into account all groups there was no significant difference in the Mayo score (**p=0.104**). The surgical timing for fracture repair did not vary

significantly among groups (**p=0.369**). The entire patient group also had similar timing from trauma to release surgery (**p=0.918**). Comparing the increase in flexion-extension arc of motion of all patients no significant difference was found (**p=0.834**). Insufficient data on rotation arc of motion was available to compare all the groups.

Conclusions: Release of elbow contractures in patients with elbow trauma had fair results. No significant difference in functional outcome between groups was obtained. The higher energy supra-intercondylar fractures however, tended to do the worst along with elbow dislocations that were complicated with head trauma and prolonged mechanical ventilation. Heterotopic bone formation was a major complication in this study.

A-9 Prevalence of Steroid Receptors and HER2/neu in Breast Cancer Biopsies of Women Living in Puerto Rico: Follow-up 2001 to 2004

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Introduction. Determination of the estrogen receptor (ER) and progesterone (PR) receptor presence on biopsy specimens of breast carcinoma prior to treatment is standard procedure for determination of the need for endocrine therapy as part of management in these patients. The primary clinical goal for testing HER2/neu protein overexpression is to determine eligibility for starting treatment with Trastuzumab, a mediator of antibody-dependent cellular cytotoxicity that selectively combines with the HER2 receptor. The purpose of this study is to determine the prevalence rate of estrogen and progesterone receptors and HER2/neu in breast cancer biopsies analyzed in the Laboratory of Immunohistochemistry at the University of Puerto Rico School of Medicine from 2001 to 2004, and to determine the relationship in expression between them in both in-situ and invasive breast carcinoma specimens.

Method. We performed retrospective analyses of 1924 breast cancer biopsies which covered the period 2001 to 2004. Paraffin-embedded blocks of breast cancer tissue were received from hospitals and pathology laboratories located throughout the island specifically for routine determination of invasive or intraductal carcinoma status and analysis of steroid receptors (ER/PR) and HER2/neu expression by immunostaining techniques using Ventana Medical Systems ® automated systems.

Results. From 2001 to 2004 ER and PR expression was observed in 70.09% and 54.14% respectively of invasive breast cancer biopsies. During the same period ER and PR were expressed in 80.36% and 60.36% respectively of in-situ breast carcinoma biopsies. HER2/neu over-expression was observed in 41.21% of in-situ and 25.47% of invasive breast carcinoma biopsies. The ratio of HER2/neu positive in-situ breast carcinoma biopsies to HER2/neu positive invasive breast carcinoma biopsies was 1.66.

Conclusions. The prevalence of ER and of PR among invasive breast cancer biopsies of women living in Puerto Rico from 2001 to 2004 was slightly higher than those previously determined for the year 2000, but still lower when compared to females in the United States. The ratio of HER2/neu (+) ductal carcinoma in-situ biopsies to HER2/neu (+) invasive breast carcinoma biopsies for Puerto Rican women was 1.66, which is close but lower than the expected ratio of 2 among US women. This is in agreement with the lower prevalence of HER2/neu in in-situ biopsies found in Puerto Rican women. A decline in the rate of HER2/neu expression for both in-situ and invasive breast cancer biopsies was also observed.

Hormone receptors prevalence in breast cancer biopsies of women living in Puerto Rico is increasing and becoming similar to those of women living in the US. This may be explained by lifestyle and environmental similarities that affect how breast cancer develops in both populations.