DIVISION OF PLASTIC SURGERY
ANNUAL
RESIDENT RESEARCH DAY

Friday, May 4th, 2012

Ivey Spencer Leadership Centre
551 Windermere Road, London
Elm Room

The Royal College of Physicians and Surgeon of Canada, Region 3 Advisory Committee has provided a continuing education grant in support of our meeting.
The Educational Foundation of the Canadian Society of Plastic Surgeons has provided a Continuing Medical Education Grant in support of our program.
Dr. Peter Lennox is a RCPSC-certified Vancouver, BC plastic surgeon whose exceptional skills, training, and experience make him a sought-after educator, a surgeon his colleagues trust to train the next generation of surgeons.

Medical Training

After earning his undergraduate and medical degrees from the University of British Columbia (UBC), Dr. Lennox completed his internship at Dalhousie University in Halifax, Nova Scotia. He returned to UBC for his residency in Plastic Surgery followed by a fellowship in Breast Reconstruction at Emory University in Atlanta and an additional clinical fellowship at the University of North Carolina in Charlotte.

Role as an Educator

Currently, Dr. Lennox serves UBC in several prestigious roles including:

- Chair of the Plastic Surgery Residency training program Accreditation Committee
- Director of the Breast Reconstruction program
- Clinical associate professor in the UBC Faculty of Medicine.
Credentials & Accomplishments

Dr. Lennox earned certifications from the Licentiate of the Medical Council of Canada and he is a Fellow of the Royal College of Physicians and Surgeons of Canada. Other key facts about Dr. Lennox include:

- He is an active member in numerous professional organizations including the Canadian Society of Plastic Surgery and the BC College of Physicians and Surgeons.
- He has authored numerous articles in prestigious scholarly journals including the *Annals of Plastic Surgery* and *Plastic and Reconstructive Surgery*.
- He is a frequent speaker and lead presenter at national and international conferences.
- He is a past President of the Northwest Society of Plastic Surgeons and former President of the Educational Foundation of the Canadian Society of Plastic Surgeons.
- He is also the former Program Director of the Postgraduate Plastic Surgery Residency training program.

In addition, Dr. Lennox has been honored for his superior teaching, scholarship and service and is often called upon by fellow cosmetic plastic surgeons in Vancouver, BC for training and education. His special interests include breast reconstruction and microsurgery, as well as cosmetic surgery. He is on staff at Vancouver Hospital and Providence Health.

Personal Information

Outside of medicine, Dr. Lennox has two children, ages 6 and 4 and enjoys travel, playing golf, skiing, and collecting wine. We are very pleased that Dr. Lennox could take the time to be with us here today.
PLASTIC SURGERY RESIDENTS

Dr. Jacqueline Piggott (PGY-1)
Dr. Buki Ayeni (PGY-1)
Dr. Rasha Baaqeeel (PGY-2)
Dr. Romy Ahluwalia (PGY-2)
Dr. Kristina Lutz (PGY-2)
Dr. Tanya DeLyzer (PGY-3)
Dr. Omodele Ayeni (PGY-3)
Dr. Rebecca Greer-Bayramglu (PGY-4)
Dr. Aaron Grant (PGY-4)
Dr. Stephanie Power (PGY-4)
Dr. Haemi Lee (PGY-5)
AGENDA

8:00 a.m. – 8:25 a.m. Breakfast in South Atrium

8:25 a.m. – 8:30 a.m. Introduction and acknowledgement of Sponsors

8:30 a.m. – 9:00 a.m. Dr. Peter Lennox, Visiting Professor
Topic: “Collaboration in Breast Reconstruction”

9:00 a.m. – 9:08 a.m. Dr. Jacqueline Piggott (PGY-1)
Topic: “The Effect of Botulinum Toxin A in the Regeneration of the Rat Tibial Nerve”

9:08 a.m. – 9:16 a.m. Dr. Buki Ayeni (PGY-1)
Topic: “Postoperative Cognitive Dysfunction after Major Reconstructive Surgery”

9:16 a.m. – 9:24 a.m. Dr. Rasha Baaqeel (PGY-2)
Topic: “The Initial Measurements in Unilateral Cleft Lip Deformities and Post-operative Repair Outcomes, Is There a Correlation?”

9:24 a.m. – 9:29 a.m. DISCUSSION

9:30 a.m. – 9:38 a.m. Dr. Romy Ahluwalia (PGY-2)
Topic: “The Role of Velocity of Trauma in Lefort One Craniofacial Fracture Patterns”

9:38 a.m. – 9:46 a.m. Dr. Kristina Lutz (PGY-2)

9:46 a.m. – 9:54 a.m. Dr. Tanya DeLyzer (PGY-3)
Topic: “Characterizing the Aging Eyebrow”

9:54 a.m. – 9:59 a.m. DISCUSSION

10:00 a.m. – 10:30 a.m. MORNING BREAK with the Exhibitors
South Atrium and Juniper Room
AGENDA

10:30 a.m. – 10:38 a.m. Dr. Omodele Ayeni (PGY-3)
**Topic:** “Patient Satisfaction Following Breast Reconstruction”

10:38 a.m. – 10:46 a.m. Dr. Rebecca Greer-Bayramoglu (PGY-4)
**Topic:** “A Novel Tendon Suspension Technique for Anatomic Reconstruction of the Medial Paralytic Lower Lid”

10:46 a.m. – 10:54 a.m. Dr. Aaron Grant (PGY-4)
**Topic:** “Lidocaine and the Tumescent Technique”

10:54 a.m. – 10:59 a.m. **DISCUSSION**

11:00 a.m. – 11:08 a.m. Dr. Stephanie Power (PGY-4)
**Topic:** “Critical Analysis of Consecutive Unilateral Cleft Lip Repairs by Parents Versus Surgeons: Determining Ideal Sample Size”

11:08 a.m. – 11:16 a.m. Dr. Haemi Lee (PGY-5)
**Topic:** “Creating Objectives for a Breast Reconstruction Knowledge Test”

11:16 a.m. – 11:21 a.m. **DISCUSSION**

11:21 a.m. - 12:00 p.m. Dr. Peter Lennox, Visiting Professor
**Topic:** “Non-autologous Breast Reconstruction and Radiotherapy”

12:00 p.m. – 12:15 p.m. **DISCUSSION**

12:15 p.m. – 1:00 p.m. **LUNCH** with Exhibitors
Juniper Room
ABSTRACTS
The Effect of Botulinum Toxin A in the Regeneration of the Rat Tibial Nerve

Piggot J, Matic D

Introduction: Peripheral nerve sacrifice is not uncommon in tumor resection surgery. Attempts to accelerate nerve regeneration, including studying the effects of neurotrophic factors, are ongoing. We aimed to determine if Botulinum toxin A (BtA), a paralytic that upregulates Calcitonin gene-related peptide (CGRP), promotes nerve regeneration and recovery if administered prior to nerve injury.

Methods: Our three-part study involved first quantifying CGRP levels in rat nerve and muscle following BtA injection. Part II examined functional recovery when BtA injection was administered prior to total nerve transaction (TNT) and repair. Functional recovery was quantified using print length factor (PLF). Part III again examined functional recovery following BtA injection, TNT and repair, with multiple experimental groups, varying timing and BtA concentration.

Results: CGRP levels increased following BtA injection, and peak levels corresponded with maximal functional paralysis in Part I. No significant differences were found between experimental groups in Parts II and III, and no significant recovery was seen.

Discussion: Pre-injury BtA injections did not demonstrate significant nerve recovery over the course of the experiment. The effect of BtA remains inconclusive, and future studies with increased sample size and length are warranted.
Postoperative Cognitive Dysfunction after Major Reconstructive Surgery

Ayeni B, Temple C

**Purpose:** Postoperative cognitive dysfunction (POCD) is a well-documented complication related to major cardiac surgery. Given the paucity of literature investigation the incidence of this condition in reconstructive surgery, the aim of this project was to establish the incidence of POCD in breast reconstruction patients and to establish any associated risk factors.

**Methods:** A sample of 36 patients was recruited from which 17 underwent non-microsurgical breast reconstruction, while 19 underwent microsurgical breast reconstruction. As a baseline, each patient completed a battery of neuropsychological tests to assess cognitive dysfunction. Postoperatively, each patient completed the same battery of neuropsychological tests 1 week, 3 months, and 1 year after surgery. We examined patient variables (age, BMI,) and procedural variables (type of reconstruction, anaesthetic time, postoperative infection, lowest intraoperative blood pressure). The primary outcome was to determine the incidence of POCD in breast reconstruction patients.

**Results:** There was an incidence of 38.9% of POCD within the total sample. Of this total, the majority (57.1%) of patients that experienced postoperative cognitive dysfunction underwent microsurgical breast reconstruction.

**Discussion:** Postoperative cognitive dysfunction was observed in a higher proportion amongst patients undergoing microsurgical breast reconstruction, particularly around 1 week post operatively.

**Teaching Objectives:** Participants will be able to better communicate potential risks of breast reconstructive options. Participants will also enrich their ability to guide surgical decision making with evidence.
The Initial Measurements in Unilateral Cleft Lip Deformities and Post-operative Repair Outcomes, Is There a Correlation?

Baaqeel R, Matic D

Objective: The purpose of this study is to determine if an objective pre-operative measurement of severity in the unilateral cleft lip deformity correlates with the repair outcome.

Methods: 39 consecutive pre-operative and two-year post-operative photographs of unilateral cleft lip repairs were subjectively evaluated, using qualitative postoperative 5-point Likert scale (poor to excellent) and quantitative rating scales (1-10), by ten expert cleft lip surgeons in an earlier study. We retrospectively reviewed these cases and extracted all documented intraoperative standardized caliper measurements including: lip height, lip width, cupid’s bow peak, nostril width on cleft and non-cleft sides plus the cleft width deformity. Differences between sides were calculated to determine severity. Linear regression model was then used to assess the correlation between the preoperative measurement differences and the expert’s post-operative outcome assessment.

Results: 35 cases had some or all of the above mentioned measurements documented. Cleft severity did not correlate significantly with expert’s qualitative and quantitative assessment of post-operative repair outcome. For post-operative rating the regression model showed that the preoperative measurements could only explain 0- 2.4% of the variability in the experts rating. For the postoperative outcome the preoperative measurements could only explain 0- 3.4% of the variability in the experts assessment.

Conclusions: The results of our study showed no correlation between pre-operative cleft severity and final cleft lip repair outcome.
The Role of Velocity of Trauma in Lefort One Craniofacial Fracture Patterns

Ahluwalia R, Yazdani A

**Purpose:** This study sought to assist in the understanding of fracture patterns found in unilateral and bilateral LeFort one craniofacial trauma.

**Method:** A retrospective medical record review was conducted for one hundred and two patients from a consecutive cohort that were operated on by a single surgeon from 2007-2011 for craniofacial trauma. These patients represent a total of one hundred and fifty facial fractures of which twenty-seven percent were LeFort one fractures. Records were reviewed for demographics, method of trauma and velocity of impact. All fractures were then mapped by their point of entry on the lateral buttress and their point of exit on the piriform aperture using measuring tools on the post-reconstruction CT 3d images. A multivariate logistic regression model based on the variables found to be significant through univariate testing was employed. The points were expressed as ratios such that a 1.0 would represent entering and exiting at the top of the lateral buttress and piriform aperture respectively.

**Results:** Our results revealed that fracture patterns differed based on the level of velocity of trauma. High velocity trauma entered the lateral buttress and exited the piriform aperture significantly higher than low velocity trauma.

**Conclusion:** High velocity trauma results in higher Lefort one fracture patterns as compared to low velocity trauma.
Current biopsy practices for suspected melanoma: A Survey of Southwestern Ontario Family Physicians

Lutz K, Hayward V, Wong E, Joseph M, Temple C

Introduction: Patients routinely present to their family physicians (FPs) with pigmented lesions suspicious of melanoma. If the diagnosis of melanoma is made early, then patient morbidity and mortality will decrease. The objective of this study was to assess current biopsy practices used by FPs in the diagnosis of melanoma.

Methods: Using the CPSO physician directory, a computer-generated random sample of 200 FPs from large and small communities in Southwestern Ontario were identified. Paper mail-based surveys were sent to 200 FPs using the modified Dillman protocol. Exclusion criteria included physicians not practicing clinical medicine and residents. The survey explored 3 domains: practice setting, melanoma knowledge, and biopsy practices.

Results: 43.1% of eligible FPs completed our survey. Respondents were diverse in demographic and practice characteristics. Median (IQR) score on melanoma knowledge questions was 60% (40%, 80%). 64.3% of FPs has diagnosed a patient with melanoma through tissue biopsy in the past 2 years. 19.0% of FPs always performs an excisional biopsy of skin lesions suspicious of melanoma. Of those who do not perform excisional biopsies, the main factors contributing to this decision are location of the lesion and inability to close the defect primarily. If an excisional biopsy is not performed, 47.8% of FPs will perform an incisional biopsy.

Discussion: Many FPs are performing biopsies in the work-up of melanoma; however, there are barriers that prevent FPs from doing so. Future directions include addressing these barriers and educating FPs on the ease of utilization of the incisional biopsy as a practical alternative.
Characterizing the Shape of the Aging Eyebrow

DeLyzer T, Yazdani A

Introduction: Ideal eyebrow aesthetics have been refined and give a framework for the goals of eyebrow and forehead rejuvenation procedures. Most authors agree upon an ideal shape with a lateral slant terminating lateral to the lateral limbus. Our study aims to characterize the change in eyebrow shape that occurs with age, and to correlate this with changes in forehead wrinkles, in order to better direct brow rejuvenation procedures.

Method: We analyzed AP standardized facial photographs of 100 women aged 20-80 at rest and with active elevation of the brow. The height of the eyebrow at the medial limbus, and at the highest point, was measured from a mid-pupillary horizontal. The slope of the eyebrow was calculated. Wrinkle number and severity was recorded, using a validated severity score, for medial and lateral forehead, glabella, and crow’s feet. We used a linear regression model to analyze the relationship between slope and age, as well as slope and forehead wrinkles.

Results: We found that there is a correlation between increasing age and a decrease in the slope of the eyebrow. As well, with decreasing slope, we found an increase in the number and severity of medial forehead wrinkles.

Conclusions: Our results demonstrate that with increasing age, the slope of the eyebrow decreases, suggesting a flattening in the shape. As well, with this flattening there is increasing severity of medial forehead wrinkles at rest, suggesting increased frontalis activity. Brow rejuvenation procedures aimed at decreasing medial frontalis activity should create a more youthful brow shape.
Patient Satisfaction Following Various Forms of Reconstructive Breast Surgery

Ayeni O, Temple-Oberle C

Introduction: Evaluating patient satisfaction using a breast reconstruction specific instrument is in its infancy. Currently, patient-rated outcome measures for breast reconstruction are limited to general outcome measures for the breast cancer population. Furthermore, a lack of standardized instruments specific to breast reconstruction has impeded the ability of previous studies to accurately evaluate patient perception and satisfaction with various types of breast reconstruction. The objective of this study was to examine the differences in patient satisfaction amongst women who have undergone various types of breast reconstruction (namely, alloplastic vs. autologous breast reconstruction) in a single institution, two surgeon setting. Given that process of care is not of specific interest to this study, the BRECON-31™ will be used to evaluate patient-rated breast reconstruction outcome measures.

Methods: The BRECON-31™ is a thirty-one item, eight subscale breast satisfaction questionnaire developed from an initial set of 913 items through a stepwise process of item development, item reduction, statistical analysis and principal components analysis. Additional four-item nipple and ten-item abdominal subscales were developed and included for use where applicable. The patient-rated instrument is a valid, reliable, and reproducible questionnaire, which elicits a woman’s feelings, satisfaction, and body image concerns with her breast reconstruction.

One hundred and fifty women from Dr. Temple-Oberle and Dr. Ross’ practices who had previously undergone reconstructive breast surgery following mastectomy at St. Joseph’s Health Care Centre between 2003 and 2011 were invited to participate in this study by completing the BRECON-31™. From this subpopulation one hundred and twenty six women were mailed a package including the Information and Consent Document, the BRECON-31: Breast Reconstruction Satisfaction Questionnaire, a stamped, addressed envelope, and a $5 gift certificate. Patient demographics, response rates, and questionnaire responses were
then collected and analyzed. A formal sample size calculation was not used for the administration of the questionnaire.

**Results:** Pending Statistical Analysis

**Conclusion:** The information obtained will provide both patients and Reconstructive Surgeons with enhanced insight into relevant issues faced by women undergoing various forms of breast reconstruction. In addition, information derived from this study will better equip reconstructive breast surgeons during their preoperative education of patients as it relates to managing expectations and outcomes.
A Novel Tendon Suspension Technique for Anatomic Reconstruction of the Medial Paralytic Lower Lid

Greer-Bayramoglu R, Yoo J, Moses M, Matic D

Introduction: Paralytic lid ectropion is a significant functional problem. The paralyzed lower eyelid loses its apposition to the globe compromising control of lacrimation, worsening corneal exposure, and reducing palpebral closure. Current techniques focus on horizontal tightening, and fail to address the medial ectropion. The results are often temporary with the need for revisions. This study proposes a durable technique that reconstructs the horizontal, vertical and anterioposterior vectors medially and laterally to recreate anatomical globe apposition and improve symptoms.

Method: The first 15 patients to undergo the technique were prospectively reviewed. Data included age, sex, diagnosis, paralysis side, follow-up, donor tendon, ancillary procedures and outcome. The procedure involves threading a tendon graft along the lower eyelid margin. The tendon is anchored by transnasal wire fixation to a point posterio-superior to the posterior lacrimal crest. It is then secured laterally.

Results: Fifteen patients age 29 to 89, with follow-up of 1 to 47 months were reviewed. Diagnosis included trauma, head and neck tumours, Moebius syndrome and forceps delivery. Common ancillary procedures included upper lid gold weight, and midface suspension. Normal lid position and symptom relief was achieved in all 15 patients. 73% maintained the tendon position as reconstructed. Four patients developed mild laxity which was not clinically significant, and did not require any further procedures.

Discussion: This novel technique addresses both the medial and lateral lower lid and provides a durable restoration for the problematic paralytic ectropion. The lid is apposed to the globe along its entire length, improving lacrimal drainage, eliminating corneal exposure and aiding in palpebral closure.
Lidocaine and the Tumescent Technique

Grant A, Richards R

Background: Tumescent Technique liposuction is a popular method of outpatient body contouring. This technique allows for adequate removal of excess adiposity, requires minimal sedation, and may be performed in the clinic setting. There is no definite consensus on the optimum dose of lidocaine required for the procedure, with reported dosages ranging from 7mg/kg to 90mg/kg. The most widely accepted dose is 35mg/kg, however, this is often inadequate to perform liposuction on more than one body area. The purpose of this study was to review the dosage of lidocaine used in Tumescent Technique liposuction at our institution, and to determine the complication rate associated with increased dose.

Methods: A two-year retrospective chart review of patients who had outpatient liposuction at our centre was completed. Patient demographics, area of liposuction, lidocaine dose, and complications were recorded. Analysis was completed with SSP statistical software.

Results: Seventy-four patients were reviewed: 93% were female, and average age was 48 years. Over half of the patients had liposuction on more than one anatomic area, and average dose of lidocaine was 44 mg/kg. No major complications were reported, and only 6.7% had minor complications. The average dose used in patients with recorded complications was 51 mg/kg, and these complications were limited to nausea and lightheadedness.

Conclusions: This review suggests that higher doses of lidocaine may be used with the Tumescent Technique when performing liposuction on larger body areas. We have found it to be a safe and well-tolerated practice.
Critical Analysis of Consecutive Unilateral Cleft Lip Repairs by Parents Versus Surgeons: Determining Ideal Sample Size

Power S, Matic D

Background: Previously we found poor agreement between cleft surgeons when evaluating lip repairs and no statistical support for presenting 10 consecutive cases to reflect average surgical results. The purpose of this follow-up study is to compare parents' evaluations of cleft severity and outcomes to those of surgeons. Secondary objectives are to determine the validity of showing consecutive lip repairs to parents and to calculate inter-rater reliability.

Methods: Consecutive pre- and two-year post-operative photographs of the unilateral cleft lip/nose complex were included from one practice. Ethics approval and informed consent were obtained. Photographs were randomized and evaluated by parents of patients with cleft lips within a multidisciplinary clinic using both descriptive and qualitative scales. Evaluations were compared to those performed by senior cleft surgeons at the American Cleft Palate-Craniofacial meeting. Parametric and non-parametric analyses were performed according to chronologic, consecutive order. The mean standard deviation over all raters enabled calculation of expected 95% confidence intervals around a mean tested for various sample sizes.

Results: Photographs of 39 patients were evaluated by 20 parents and 10 senior cleft surgeons. Parents demonstrated higher inter-rater agreement for cleft severity (ICC=0.77) and outcomes (0.84) than surgeons (ICC=0.65 and 0.21, respectively). Narrowing 95% confidence intervals within one point on both post-operative grading scales required presenting 27 consecutive cases to surgeons versus 12 cases to parents. Within both groups, outcomes did not correlate with cleft severity (parents, \( p = 0.56 \); surgeons, \( p = 0.28 \)).

Conclusions: Parents demonstrated stronger agreement than surgeons when evaluating both cleft severity and outcomes, which may reflect different evaluation criteria or surgeon bias when evaluating a colleague's results. There may be statistical validity in showing 12 consecutive lip repairs to parents as an educational tool in pre-operative consultations.
Creation of Objectives for a Validated Test on Breast Reconstruction Comprehension

Lee H, Ross D

**Purpose:** To develop educational objectives for a validated test to assess the level of patient knowledge in breast reconstruction.

**Method:** Using a modified Delphi method, a panel of experts in breast reconstruction were interviewed using a scripted questionnaire to ascertain what they considered to be the minimum knowledge required by patients to make an informed decision about surgery for breast reconstruction. Parallel focus groups consisting of patients who previously underwent breast reconstruction, were recruited to provide patients' perspective on the adequacy of the education they received pre-operatively. Recorded comments were reviewed for content and common themes. Items generated were organized to create objectives based on recurrent answers or ones that generated consensus within patient focus groups.

**Results:** 5 experts were interviewed with 22 standard questions. 2 patient focus groups, each with 10 members, discussed 21 topics on the adequacy of pre-operative breast reconstruction education. The expert and patient focus groups identified key themes including: information about differing techniques for breast reconstruction, timing and duration of each procedure, number of required clinic visits, and complications. Educational objectives were then generated to reflect the emphasis placed on each topic.

**Conclusion:** Objectives with high face validity were created using a multifaceted approach combining expert panel interviews and patient group discussions. These objectives will be the basis for developing a validated test for breast reconstruction knowledge.
The Division of Plastic Surgery would like to extend their appreciation to the following for the support provided for this event:

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Thank you for participating in our Annual Resident Research Day!

Plastic Surgery Resident Research

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