Development of an Algorithm for Prevention of Dermatome-Induced Lacerations: Incidence, Management, and Preventive Measures

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INTRODUCTION: Dermatome-induced laceration is a known complication but there is a paucity of literature discussing the incidence or the predisposing factors. The aim of this study was to determine the incidence rate and identify those risk factors in order to develop an algorithm for residents to improve patient safety.

METHODS: An 18-question survey was sent to all Burn Unit Directors in the US and Canada investigating the type and location of practice, average annual caseload of skin graft harvesting, number of dermatome-induced lacerations, donor site location, harvesting technique and equipment, severity of laceration, etiology and patient related factors.

RESULTS: A total of 56 responses (42% response rate) were received from Burn Unit Directors in the US and Canada. A total of 133 lacerations were reported for the prior 5 years. The overall incidence of dermatome-induced lacerations was calculated at 0.1% per year (1.3 per 1,000 cases). The most common causes were excessive pressure with the dermatome (25.7%) and patient-related factors (18.9%) such as skin laxity (23%) and age (17.6%). Most lacerations occurred when the skin graft were harvested from the thigh (77%) with assistance of mineral oil (75.7%) as a lubricant, and by using a Zimmer air dermatome (73%) with a 4 inches guard (63.5%), 0.010–0.015 inches thickness (78.4%), and 30–45 degrees angulation (47.3%).

CONCLUSION: According to this study, dermatome-induced lacerations are rare events. However, every step should be taken to prevent them starting from proper identification of patients at risk, proper set up and use of the dermatome.

Study of Venous Congestion after Partial Limb Amputation in Rats: Protective Effects of Tirofiban or Heparin in Secondary Ischemia

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Venous thrombosis is the main complication of vascular microsurgery an early intervention is mandatory to rescue the flap, with a success rate of only 50% after surgical revision; microcirculation thrombosis, oxygen free radicals production and edema are the main elements of ischemia/reperfusion (I/R) injury, and protective therapies aim to mitigate these changes. Antiplatelets and anticoagulants are used in different organs to control this injury. In this study, in a partial hind limb amputation model submitted to global ischemia, it was tested the protective effect of Heparin or Tirofiban during secondary ischemia after venous congestion. Sixty rats divided in three groups of 20 animals each were operated; after global ischemia of 90 minutes each group was injected into the contra lateral femoral vein, one of the following solutions: 1 ml of saline solution NaCl 0,9% - control group (CG); 1ml of Heparin 200 UI/kg - experimental group 1 (G1); 1ml of Tirofiban 50 μg /ml - experimental group 2 (G2). Sixty minutes of limb reperfusion was performed, and a secondary period of limb ischemia started with the clamping of the femoral vein only (limb congestion) which lasted for 90 minutes (secondary ischemia). After that, the vein clamp was removed and a 60-minute reperfusion period was observed; at the end of the second reperfusion period, the right gastrocnemius muscle was removed and fixed in 10% formaldehyde, animals were euthanized with a lethal dose of Pentobarbital. Muscle fibers were scored as uninjured or injured based on the morphology of individual fibers; interstitial edema and bleeding were graded on a four-point scale. The control group had more damaged muscle cells 54.6 ± 10.6% when compared to heparin 24.7 ± 11.7% and tirofiban 24.6 ± 8.6, all reached statistical significance (p<0.001); These comparisons were analysed using ANOVA and post-hoc Tukey. The single use of Heparin or Tirofiban showed a protective effect on venous congestion after global ischemia. When evaluating the edema,
none experimental group had statistically lower rates than the CG, whilst both drugs reduced the extravasation of red blood cells compared with the control group (p <0.001).

### Surgical Site Infection in Immediate Breast Reconstruction: DoesChemotherapy Timing Make a Difference?

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**INTRODUCTION:** Chemotherapy has been shown to adversely affect post-operative outcomes in a variety of surgical fields, leading to delayed wound healing and increased susceptibility to infections. We aim to analyze the impact of chemotherapy timing on wound infections after immediate breast reconstruction (IBR).

**METHODS:** A single-center, retrospective chart review of patients undergoing IBR between 2010 and 2015 was performed. Patients were divided into four groups: those with neoadjuvant chemotherapy only, adjuvant chemotherapy only, both adjuvant and neoadjuvant, and those with no chemotherapy. Subgroup comparisons were made. Outcomes of interest included surgical site infection and timing of post-operative wound infection.

**RESULTS:** A total of 949 reconstructions were performed over the study period. Subgroup breakdown was as follows: 56 (5.9%) neoadjuvant only, 173 (18.2%) adjuvant only, 18 (1.9%) both, and 702 (74.0%) none. Overall infection rates were 10.7%, 10.4%, 22.2%, and 6.1% in the four groups, respectively (p=0.015). On multivariate analysis, no significant differences were observed when comparing presence or absence of chemotherapy in the overall reconstruction cohort or when subgrouped by reconstruction modality – autologous or alloplastic. There were no significant differences in time from neoadjuvant chemotherapy to surgery date noted between patients who developed a post-operative surgical site infection and those who did not (4.40 ± 1.58 vs 4.72 ± 1.39 weeks; p=0.517).

**CONCLUSION:** In our study, chemotherapy timing did not increase the odds of surgical site infections in patients undergoing immediate breast reconstruction.

### Graphical Calculation of Estimated Energy Expenditure in Burn Patients

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**INTRODUCTION:** Estimated energy expenditure (EEE) equations have proven to overestimate the amount of caloric support necessary for burn patients. Ireton-Jones et al derived two equations, which have proved their reliability, but remain challenging to apply in a clinical setting given the difficult mathematics involved. This study aims to introduce a graphical calculation of EEE in burn patients that can be easily utilized in the clinical setting.

**METHODS:** The multivariant linear regression analysis from Ireton-Jones et al yielded two equations which were rearranged into the form of a simple linear equation of the type y = mx+b. By choosing an energy expenditure and the age of the subject, the weight was calculated. The end-points were then calculated and a graph was mapped by means of Adobe FrameMaker.

**RESULTS:** A graphical representation of Ireton-Jones et al’ equations was obtained by plotting the weight (kg) on the y-axis, the age (years) on the x-axis, and a series of parallel lines representing the EEE in burn patients. The EEE has been displayed graphically on a grid to allow rapid determination of the estimated energy expenditure needed for a given patient of a designated weight and age. Two graphs were plotted: one for