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**PURPOSE:** Ventral hernia repair (VHR) with concomitant component separation (CS) achieves better structural support in large fascial defect abdominal wall reconstructions. Traditionally, CS is performed by plastic surgeons but has recently become more popular in other specialties such as general surgery. Previous reports indicate that although CS reduces hernia recurrence, it is associated with an increased risk of complications. This study evaluates outcomes associated with VHR with CS (VHR + CS) compared to VHR alone and a subanalysis of VHR + CS outcomes stratified by plastic versus general surgeons.

**METHODS:** A retrospective chart review of all VHRs between January 2009 and June 2017 at a single institution was performed. Demographic data, comorbidities, procedure details, length of stay (LOS), postoperative complications, and recurrence rates were recorded. Patients with <6 months follow-up or <30 cm² defect size were excluded. Follow-up was defined as surgical follow-up, abdominal computed tomography or magnetic resonance imaging, or surgical visits with well-documented abdominal examinations.

**RESULTS:** A total of 185 patients were identified: group I (n = 42) received VHR + CS and group II (n = 143) received VHR alone. Differences in defect size (217.4 versus 149.2 cm²; P = 0.02) and concurrent procedures (1.4 versus 0.9; P = 0.02) between groups I and II, respectively, reached significance. In addition, group I had significantly increased LOS (group I 15.0 days versus group II 4.6 days; P = 0.0049); however, no difference in postoperative complications (22.7% versus 21.6%; P = 0.89) or recurrence rates (22.7% versus 14.1%; P = 0.052) between groups I and II, respectively, was appreciated. Group I (n = 42), who received VHR + CS, was further stratified by specialty; group IA (n = 24) VHR + CS was performed by plastic surgeons, and group IB (n = 18) VHR + CS was performed by general surgeons. Differences in defect size (262.8 versus 149.6 cm²; P = 0.046) and concurrent procedures (1.7 versus 0.9; P = 0.047) were noted in groups IA and IB, respectively. There were no differences in recurrence rate (20% versus 20%; P = 0.656), LOS (8.8 versus 6.3 days; P = 0.33), or complication rate (29.1% versus 27.8%; P = 0.6) in groups IA and IB, respectively.

**CONCLUSION:** Despite the use of CS in larger, more complex VHRs in our overall patient population, VHR + CS provides comparable outcomes in abdominal wall reconstruction at our institution. In our subgroup analysis, VHR + CS performed by plastic surgeons showed no difference in LOS, complication rates, and recurrence rates compared to general surgeons, despite larger defect sizes, more concurrent procedures, and more complex reconstructions performed in the plastic surgery cohort. Performance of VHR + CS is a viable approach to improving overall outcomes in patients with larger, complex hernias and may directly benefit from plastic surgery participation.

**Prognostic Indicators for Upper and Lower Extremity Amputations in a Verified Burn Center**

**Presenter:** Danielle Anne Thornburg, MD

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**INTRODUCTION:** Reconstructive surgeons are often faced with the need to amputate when limb salvage is no longer a viable option. Burn center patients present not only with burn injuries but also necrotizing infections, purpura fulminans, frostbite, toxic epidermal necrolysis, and crush/degloving trauma. With comorbidities and extent of injury, all are at risk for amputation given the soft tissue destruction and systemic organ compromise that occurs. Because they are not well defined in the literature, the purpose of this study was to determine prognostic factors which predispose patients to extremity amputations. With early identification, multiple and extensive preservation salvage efforts in “at risk” cases may be eliminated, facilitate earlier recovery, and conserve finite resources.

**METHODS:** This retrospective registry review (2000–2017) compared patients who required amputations with those who were more suitable for reconstruction. Cases were further matched by age, sex, total percent body surface area (%TBSA), and type/location of injury, to control for possible confounding variables.

**RESULTS:** During this study period, 110 patients with amputations were compared to 12,997 with upper or lower salvaged extremities. The main etiology was flame burn (25%) with a high percentage burn injury as the most common precipitating event (59%). Amputations were mainly digital (39%) and transtibial level (33%). Comparing amputees (AP) to non-APs (NAPs), there were significant differences in mean age (50 versus 34 years; P < 0.001), %TBSA (20 versus 8%; P = 0.003), and length of stay (33 versus 11 days; P < 0.001). Comorbidities such as cardiovascular (relative risk, 4.3; P < 0.001), liver (RR, 4.8; P < 0.001), renal insufficiency (RR, 19.1; P < 0.001), diabetes mellitus (RR, 5.0; P < 0.001), and alcohol abuse (RR, 4.3;
Mechanical Stretch Preconditioned Adipose-derived Stem Cells Improve Impaired Wound Healing by Inducing Macrophage M2 Polarization

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BACKGROUND: Uncontrolled inflammatory response during wound healing leads to aberrant repair. Administration of cells/cell factors capable of screwing polarized macrophages toward the anti-inflammatory M2 has shown a favorable prospect to the treatment of inflammatory diseases. Studies have reported that adipose-derived stem cells (ADSCs) have an immunoregulatory effect and improve cutaneous wound healing, but the therapeutic effect on impaired wound still needs to be enhanced. Previously, we found that mechanical stretch preconditioning could enhance the cellular viability and secretion function of ADSCs in vitro. However, it is unknown whether mechanical stretch preconditioning could enhance the immunoregulatory effect of ADSCs on impaired wound healing. The aim of our study is to investigate whether mechanical stretch preconditioned ADSCs could regulate macrophage polarization and improve impaired wound healing.

MATERIALS AND METHODS: Mouse ADSCs were obtained and divided into 2 groups: stretched ADSCs (ms-ADSCs) and nonstretched ADSCs (con-ADSCs). Cyclic mechanical stretch (10%, 12 hours, 0.5 Hz) was applied by the Flexcell FX-5000 system. The ms-ADSCs or con-ADSCs were cocultured with murine macrophage RAW264.7 cells with/without LPS or interleukin (IL)-4 stimulation for 24 hours, respectively. Then M1 markers (iNOS, tumor necrosis factor [TNF]-α, and IL-6) and M2 markers (Arg-1, CD2016, and IL-10) were determined by reverse transcription-quantitative polymerase chain reaction. Eight-millimeter diameter full-thickness excision wounds were made on the dorsal skin of db/db diabetic mice as a delayed wound healing model. Intradermal injections of 5 × 10^6 ms-ADSCs or con-ADSCs around wound margins were conducted at 2 days postinjury. Histologic studies were performed, and the proinflammatory cytokines (TNF-α, IL-1β, and IL-6) and prohealing cytokines (IL-10, VEGF, and insulin-like growth factor-1) were observed by immunohistochemistry. The M1/M2 polarization in vivo was further evaluated by iNOS/Arg-1 immunofluorescence via confocal microscopy.

RESULTS: The iNOS, TNF-α, and IL-6 mRNA levels of RAW264.7 cells were significantly reduced after coculture with ms-ADSCs than con-ADSCs, whereas the Arg-1, CD2016, and IL-10 mRNA levels reversed. In addition, histologic studies and immunohistochemistry showed that ms-ADSCs treatment significantly accelerated impaired wound healing and reduced inflammatory response characterized with lower expression of TNF-α, IL-1β, and IL-6 and higher expression of IL-10, VEGF, and insulin-like growth factor-1 in the wound. Besides, ms-ADSCs treatment led to a decrease of M1/M2 ratio based on the iNOS/Arg-1 immunofluorescence.

CONCLUSION: Mechanical stretch preconditioning enhanced the ADSCs-guided macrophage polarization from M1 to M2, and mechanical stretch preconditioned ADSCs improved impaired wound healing.

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Nipple-sparing Mastectomy With Immediate Neurosensitization of the Nipple Areola Complex

Presenter: Cindy Rodriguez, BS