Comparison of Tumor Recurrence in Oncoplastic Pelvic Reconstruction with Vertical Rectus Abdominis Musculocutaneous (VRAM) versus Omental Flaps: Outcomes Following Ablative Abdominoperineal Resection (APR) and Pelvic Exenteration

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**BACKGROUND:** Little is known about the impact of the type of soft-tissue reconstruction on local tumor recurrence in patients with pelvic malignancy undergoing abdominoperineal resection. Therefore, the purpose of this study is to describe our experience and outcomes in oncoplastic pelvic reconstruction for patients who underwent either vertical rectus abdominis musculocutaneous (VRAM) or omental flap following abdominoperineal resection (APR) at a single tertiary care institution.

**STUDY DESIGN/METHODS:** All patients who underwent oncoplastic reconstruction following APR with either VRAM or omental flaps at the Mayo Clinic in Rochester, Minnesota from January 1992 – January 2017 were retrospectively reviewed. Patient demographics and relevant comorbidities (i.e. hypertension, diabetes mellitus, smoking status) were collected for all patients. Additionally, chemotherapy and radiation therapy (neoadjuvant, intra-operative, or adjuvant) data were collected and analyzed. In addition, margin status at the time of oncologic resection was analyzed. Flap-specific data were collected for each approach, including use of skin paddle and rationale for using one approach over the other (i.e. previous omentectomy or diverting colostomy). Oncologic data collected includes cancer type, stage at time of APR, tumor recurrence within the flap and stage of tumor at time of recurrence. Statistical analysis was performed with SPSS Version 11.0 statistic software package (SPSS, Chicago, IL). Comparisons between groups were performed with analysis of non-parametric test. A value of $P < 0.05$ was considered statistically significant. Univariate and multivariate analyses were performed.

**RESULTS:** A total of 585 patients were identified who underwent pelvic soft-tissue reconstruction with either VRAM or omental pedicle flaps. Of these, 297 (50.8%) underwent VRAM reconstruction (270, 90.90% with skin paddle) and 288 (49.2%) underwent omental flap reconstruction. All margins were negative at time of cancer ablation surgery. Specific complications and their respective rates of occurrence in each reconstructive approach included bowel obstruction [VRAM=0; Omentum=17(5.9%)], wound dehiscence [VRAM=31(10.4%); Omentum=26(9.0%)], and tumor recurrence within pedicle flap [VRAM=14(4.7%); Omentum=40(13.9%)]. Of the 31 cases (10.4%) of wound dehiscence in VRAM patients, 6 occurred in the abdomen and 25 occurred in the perineum at the skin paddle. Chi-squared test comparing tumor recurrence between these two reconstructive approaches showed a significantly higher recurrence rate in omental flaps compared to VRAM flaps ($p= 0.000127$).

**CONCLUSIONS:** The results of this study suggest a significantly higher tumor recurrence rate in omental flap pelvic reconstruction compared to patients reconstructed with VRAM flaps. This knowledge has the potential to influence surgical planning and flap selection in oncoplastic pelvic reconstruction.

**Perineal Reconstruction after Extralevator Abdominoperineal Excision (ELAPE): Current Trends-What Is the Future?**

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AIM: Extralevator abdominoperineal excision (ELAPE) is becoming the main treatment modality for locally advanced low rectal cancer as substantial evidence link ELAPE with superior oncological outcomes than conventional abdominoperineal excision.¹

However, the extended resection performed in ELAPE creates an extensive three-dimensional soft tissue perineal defect within a previously irradiated field, increasing perineal wound complications to 40–60%.¹ Various methods have been described in order to reduce perineal wound morbidity including primary closure, flaps and biological meshes but the ideal technique remains controversial, making perineal reconstruction post-ELAPE challenging for the plastic surgeon.¹

The primary objective of this study is to appraise the post-ELAPE perineal reconstruction techniques in a UK tertiary institution. The secondary aim is to identify the technique that fulfils the principles of an ideal perineal reconstruction (function, reliability, and cosmesis).

METHODS: All patients that had undergone ELAPE and perineal reconstruction between 2009 and 2017 were reviewed retrospectively. Data included patients’ demographics, neo-adjuvant chemo-radiotherapy, histopathology, imaging, duration of surgery, reconstructive method, follow-up period and complications.

RESULTS: Seventy-three (n=73) cases were identified. 81% of the patients had neo-adjuvant chemoradiotherapy. Gluteus maximus muscular flaps (35%, 26) were associated with a higher complication rate(62%). These included perineal collection(36%), perineal pain(35%) and perineal hernia(19%).

Vertical Rectus Abdominal Muscular flaps’ (9.5%, 7) complication rate was 33% (1 flap necrosis, 1 perineal sinus and 1 perineal collection). Lotus petal (8%, 4) and Superior Gluteal Artery Perforator V-Y advancement flaps’ (8%, 4) complication rates were 75% and 16% respectively. The above flaps required an average of 134 min (range 118–145) additional operating time.

Internal pudendal artery (IPA) perforator flaps, predominantly the PTO (Perineal Turn Over) flap², were introduced in 2014 and gained popularity (35%, 26) as they are quick (mean operating time 52 min) and provide good results with only 8.6% complication rate (1 perineal hernia and 1 superficial wound dehiscence). Review of this group’s radiotherapy scans showed that IPA perforators are consistently out of radiotherapy zone.

Overall complications in all flaps were higher in irradiated patients and smokers.

CONCLUSION: Techniques involving muscular dissection are associated with higher morbidity rates (20–62%) reflecting similar trends in the literature.¹ IPA turnover perforator flaps such as the PTO flap², that do not involve perforator transposition at 90⁰ angle (as in lotus petal flaps) are associated with the lowest morbidity rate. Their concept supports the ideal reconstruction principles:

a) Function: the thick gluteal dermis acts as an autologous (as opposed to biological meshes) dermal vascularised substitute that strengthens the pelvic floor and prevents perineal hernia.²

b) Reliability: the perforators are consistent and always protected from radiotherapy ensuring good flap vascularity; the gluteal subcutaneous fat obliterates the dead space reducing collections and infections.²

c) Cosmesis: recreation of the natal cleft providing good aesthetic outcome.

REFERENCES:

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Optimizing Outcomes in Hemipelvectomy Reconstruction with the Free Fillet of Leg Flap

Presenter: Melissa Ann Mueller, MD