The Keystone Perforator Island Flap in Head and Neck Reconstruction - Indications and Outcomes from 200 Flaps.

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Abstract

Background: Worldwide, populations are aging. Survival in head and neck cancer is improving, increasing the incidence of additional or recurrent tumors and re-operative head and neck surgery, especially in Australia. The expense of free tissue transfer in time, resources and money is emphasizing the need for simpler complementary reconstructions in the majority of cases, such as locoregional flaps based on Keystone Island Flap Principles. Rigorous outcomes assessment of Keystone and related flaps in head and neck reconstruction has been lacking with the absence of any large series within the literature to date (1-4).

Methods: We undertook a retrospective review of 200 Keystone and related locoregional island flaps for fasciocutaneous head and neck reconstruction at the Peter MacCallum Cancer Centre and The Western Hospital between February 2006 and May 2012. Only cases with defect sizes over 4cm² and with complete datasets, were included in the analysis.

Results: 200 flaps were performed in 195 patients (164 male, 32 female). Median patient age was 76 (range 19-98 years) with an average of 2 comorbidities each (+/- 1.45, SD). Squamous cell carcinoma (100), melanoma (45) and basal cell carcinoma (34) were the most common tumour defects reconstructed with a mixture of other less common tumours. The median defect size reconstructed was 22.5cm² (range 4cm² to 121cm²) and median operative time was 100 minutes (range 20-908 minutes inclusive of anesthetic and resective time). There was one peri-operative death (Day 5 post-op), 7 major complications including one complete flap loss and 4 partial flap losses (2% of flaps) requiring operative management. There were 32 minor complications (15.7% of patients) including 7 partial flap losses that resolved with dressings alone. Pre- or post-operative radiotherapy and/or chemotherapy were associated with increased risk of complications (63% of complications vs 44% in general population).

Table 1: Comparison of Flap Outcomes between Wei et al 2002(5) study in 486 Anterolateral Thigh (ALT) flaps for head and neck versus our study. *-denotes Keystone or Keystone variants based on Keystone principles.

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<tr>
<td>Flap type</td>
<td>Anterolateral thigh</td>
<td>Keystone*</td>
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<tr>
<td>Flaps</td>
<td>486</td>
<td>200</td>
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<tr>
<td>Total Flap Loss</td>
<td>1.65%</td>
<td>0.5%</td>
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<tr>
<td>Partial Flap Loss</td>
<td>1.86%</td>
<td>2%</td>
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Conclusion: Keystone island flaps provide effective fasciocutaneous reconstruction in the head and neck. They have comparable or lower morbidity than other reconstructive options (see Table 1) within the published literature, making them a useful technique for our aging populations. Their preservation of reconstructive lifeboats for tumor recurrence is ideal.

References:


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No funding was provided to undertake the study.

Dr’s Findlay and Behan have co-authored a textbook on the Keystone flap: “The Keystone Perforator Island Flap Concept.” Published through Elsevier (see Ref. 3 above).