E-Appendix

It is important to derive a mathematical approximation for graft surface viability. Consider a model uniplanar surface comprised of close packed circles of equal radius *(r)*. For any three adjoining circles, an *intercenter area* is defined as the equilateral triangle (of base $2r$) with a point at the center of each circle (Fig. E-1, *A*). The *intercenter area* is taken as providing a reasonable sample surface area of the graft for consideration of percent surface viability. The *intercenter area* is given by $2.\cos 30.r^2$.

Within each *intercenter area*, there is an *extrinsic area* outwith the circles (shaded area, Fig. E-1, *B*) equal to $r^2(2.\cos 30 - \pi/2) = 0.161r^2$. The extrinsic area thus represents 9.31% of the *intercenter area.*

This model represents the axial view of a mosaicplasty surface and therefore allows an approximate calculation of the percent graft surface area compromised by absence of graft and marginal cell death. Assuming a simple close-packed model,

compromised area = *extrinsic area* + *area of marginal cell death* (Fig. E-1, *C*)

Using the above formula, a relation may be plotted expressing the compromised area as a function of the margin of cell death. The experimentally derived margin of cell death may be used to derive the percent of compromised area.