



AB072. 89. Assessment of a cell-seeded hydrogel scaffold as a novel adjunct to implant breast reconstruction

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Background: Implant reconstruction is associated with significant shortcomings, including capsular contracture, rupture and the need for reoperation, which has driven research into the field of tissue engineering. A range of regenerative strategies have been devised utilising various scaffold designs. Hydrogels are suitable for adipose tissue engineering secondary to their ability to mimic the native extracellular matrix. The aim of this study was to assess the suitability of a hyaluronic acid (HA) hydrogel as an adjunct to implant breast reconstruction post-mastectomy

and thereby overcome complications such as capsular contracture.

Methods: Two percent w/v HA at 1× and 2× crosslinking densities was loaded with mature adipocytes isolated from abdominal lipoaspirate from female patients. Metabolic activity (CCK-8), Young's modulus (compression) and swelling ratio of the HA/adipocyte hydrogels were assessed. Additionally, histology with Oil Red O staining was performed.

Results: There was no significant difference in metabolic activity of either HA/adipocyte hydrogels at day 1, 4 and 7. Young's modulus was significantly higher for 2×(9.8±0.7 kPa) compared to 1×(3.9±0.8 kPa) HA/adipocyte hydrogels at all time-points. 1× HA/adipocyte hydrogels displayed a greater swelling ratio than 2× HA/adipocyte hydrogels. Histology demonstrated positive lipid staining by Oil Red O within the hydrogel scaffold.

Conclusions: HA at a 2× crosslinking density is a promising biomaterial for adipose tissue engineering in breast regeneration.

Keywords: Adipose; tissue; engineering; breast; reconstruction

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